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RECLAMATION AND

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Project Evaluations and Funding Recommendations

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RECLAMATION AND DEVELOPMENT GRANTS PROGRAM

REPORT TO THE LEGISLATURE

Project Evaluations and Funding Recommendations

January 1999

Montana Department of Natural Resources and Conservation
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ABBREVIATIONS

ARARs	applicable or relevant and appropriate regulations
ARCO	Atlantic Richfield Company
BDG	Bonner Development Group
BMP	best management practice
BOGC	Montana Board of Oil and Gas Conservation
CECRA	Comprehensive Environmental Cleanup and Responsibility Act of 1989
CERCLA	Comprehensive Environmental Response Compensation and Liability Act of 1980
COCs	contaminant of concern
Corps	U.S. Army Corps of Engineers
DEQ	Montana Department of Environmental Quality
DFWP	Montana Department of Fish, Wildlife and Parks
DNRC	Montana Department of Natural Resources and Conservation
DOT	Department of Transportation
DPHHS	Department of Public Health and Human Services
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ETI	Environmental Technologies International
FEMA	Federal Emergency Management Agency
FRDO	Flathead Regional Development Office
GIS	geospatial information system
GWIC	Groundwater Information Center, Montana Bureau of Mines and Geology
MBMG	Montana Bureau of Mines and Geology
MCA	Montana Code Annotated
MOPG	Missoula County Office of Planning and Grants
MSCA	Montana Salinity Control Association
MSE	Mountain States Energy
MSU	Montana State University
MSW	Municipal Solid Waste
MWCB	Mine Waste Cleanup Bureau, Department of Environmental Quality
NPS	nonpoint source
NRCS	Natural Resources Conservation Service, U.S. Department of Agriculture
NWI	National Wetland Inventory
PCBs	polychlorinated biphenyls
PRP	Potentially Responsible Party
RC&D	Resource Conservation and Development Area
RCRA	Resource Conservation and Recovery Act
RDGP	Reclamation and Development Grants Program
RIT	Resource Indemnity Tax
SECBSU	South East Cut Bank Sand Unit
TCLP	Toxicity characteristics leaching procedure
TMDL	total maximum daily load
TPHs	total petroleum hydrocarbons
TS	technical specialist
UM	University of Montana
USFS	Forest Service, U.S. Department of Agriculture

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMB	Water Management Bureau
WPPS	Well Plugging Prioritization System
WQB	Water Quality Bureau

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PROJECTS SUBMITTED FOR FUNDING IN THE 2001 BIENNIUM

Following is a list of projects submitted for funding in the 2001 biennium. For easy reference, the list is alphabetized by the names of the project sponsors. However, in Chapter II the project abstracts, evaluations, and recommendations are presented in the order of their ranking by the Department of Natural Resources and Conservation and the Governor.

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CHAPTER I

PROGRAM DESCRIPTION AND PROCEDURES

Program Information

The Reclamation and Development Grants Program (RDGP) is a state-funded grant program designed to fund projects that *"indemnify the people of the state for the effects of mineral development on public resources and that meet other crucial state needs serving the public interest and the total environment of the citizens of Montana"* (Section 90-2-1102, MCA). The program, established by the 1987 Montana Legislature, is administered by the Montana Department of Natural Resources and Conservation (DNRC).

In February 1998, DNRC mailed application materials to all Montana communities, counties, the university system, conservation districts, state agencies, state legislators, and others who might benefit by program participation. The application deadline was May 15, 1998. DNRC received 21 applications for RDGP funding totaling over $5.5million. These projects are listed alphabetically by applicant on page v.

The funding source for this program is the interest income from the resource indemnity tax (RIT) trust fund. This fund, established by Section 15-38-201, MCA, receives proceeds from taxes levied on mineral production. Since 1986, 133 projects totaling more than $24 million have been authorized for funding by previous legislatures. The 1993 legislature directed that, beginning in state fiscal year 1996, a minimum of $3 million be allocated for grants. In 1993, the legislature also directed DNRC to give priority to grant requests from the Montana Board of Oil and Gas Conservation (BOGC). This priority is not to exceed $600,000 for the biennium and does not preclude BOGC from submitting additional grant requests. Additional BOGC grant requests are received and ranked by DNRC in the same manner as all other grant requests submitted.

The Reclamation and Development Grants Program Act requires that the Governor submit, by the first day of each regular session of the legislature, a list of all grant proposals received with his or her recommended priorities for funding (see Table 1). Administrative rules further provide that DNRC must furnish to the legislature a status report on previously funded projects, which is here provided in Chapter III. This report is the result of those directives.

Project Eligibility

The following excerpt from the Reclamation and Development Grants Program Act (Section 90-2-1112, MCA) establishes criteria that projects must meet in order to be eligible for funding.

1. *Except as provided under subsection (2), to be eligible for funding under the Reclamation and Development Grants Program, the proposed project must provide benefits in one or more of the following categories:*

    a. *Reclamation of land, water, or other resources adversely affected by mineral development*
    b. *Mitigation of damage to public resources caused by mineral development*
    c. *Research, demonstration, or technical assistance to promote the wise use of*

Montana minerals, including efforts to make processing more environmentally compatible

d. Investigation and remediation of sites where hazardous wastes or regulated substances threaten public health or the environment, and

e. Research to assess existing or potential environmental damage resulting from mineral development.

2. If sufficient eligible and qualified applications satisfying the mineral development objectives provided for in subsection (1) are not received or if there is a crucial state need, the department [DNRC] may evaluate and the Governor may recommend that the legislature approve funding for projects that:

a. Enhance Montana's economy through the development of natural resources, or

b. Develop, promote, protect, or further Montana's total environment and public interest, including the general health, safety, welfare, and public resources of Montana citizens and communities.

Applicant Eligibility

Any department, agency, board, commission, or other division of state government or any city, county, or other political subdivision or tribal government within the state may apply for a grant from the Reclamation and Development Grants Program.

Funding Limits

No grant may exceed $300,000. An applicant proposing more than one project may submit a separate application for each. There is no minimum funding limit.

Application Review And Ranking Procedures

The grant applications were evaluated for the proposed projects' technical and financial feasibility, public benefits to be provided, need and urgency, and impacts on the environment. Reviewers included staff members of the department's Conservation and Resource Development Division, an environmental consultant selected through a request for qualifications, and federal, state, and university personnel having expertise in specific project areas. For each application, a descriptive project assessment was written incorporating the concerns, ideas, and comments of the project reviewers.

More funds are requested than are available. Therefore, the department ranks feasible projects, so that it can recommend funding priority and funding level to the Governor and the legislature. Evaluation criteria established by the 1987 legislature include, but are not limited to:

1. The degree to which the project will provide benefits in its eligibility category or categories
2. The degree to which the project will provide public benefits
3. The degree to which the project will promote, enhance, or advance the policies and purposes of the Reclamation and Development Grants Program
4. The degree to which the project will provide for the conservation of natural resources

5. The degree of need and urgency for the project
6. The extent to which the project sponsor or local entity is contributing to the costs of the project or is generating additional nonstate funds
7. The degree to which jobs are created for persons who need job training, receive public assistance, or are chronically unemployed
8. Any other criteria DNRC considers necessary to carry out the policies and purposes of the Reclamation and Development Grants Program

Under the ranking system, a proposal could receive a maximum of 215 points. Specific criteria were established for each category to provide consistency. Of the following criteria, public benefits and need and urgency were weighted most heavily.

		Maximum Points Possible
1.	Public benefits	90
2	Need and urgency	50
3.	Appropriateness of technical design	40
4.	Financial feasibility	15
5.	Project management organization	20
	Total possible points:	215

Recommendations

After ranking the projects and recommending funding, the Conservation and Resource Development Division made its recommendations to the DNRC director. The director then presented DNRC's recommendations to the Governor. The final ranking of the proposed projects is presented in Table 1, along with funding recommendations. The locations of the 19 projects recommended for funding are shown in Figure 1.

An appropriations bill listing the Governor's recommendations will be introduced to the 1999 legislature. By appropriation or other means, the legislature may approve grants for those projects it finds consistent with the policies and purposes of RDGP.

TABLE 1

RANKING AND FUNDING RECOMMENDATIONS

Rank	Project Sponsor (Project Title)	Amount Requested	Amount Recommended	Cumulative Total Recommended
*	Montana Board of Oil and Gas Conservation 1999 "A" Orphaned Well Plug and Abandonment	300,000	300,000	300,000
*	Montana Board of Oil and Gas Conservation 1999 "B" Orphaned Well Plug and Abandonment	300,000	300,000	600,000
1	Montana Department of Environmental Quality Silver Bow Creak, Streamside Tailings, Remedial Action (1)	300,000	300,000	900,000
2	Montana Department of Environmental Quality Silver Bow Creak, Streamside Tailings, Remedial Action (2)	300,000	300,000	1,200,000
3	Montana Department of Environmental Quality Toston Smelter Reclamation Project	300,000	300,000	1,500,000
4	Townsend, City of East Pacific Mine Reclamation	202,500	202,500	1,702,500
5	Montana Department of Environmental Quality Frohner Mine Reclamation Project	300,000	300,000	2,002,500
6	Montana Department of Environmental Quality Great Republic Smelter Reclamation Project	300,000	300,000	2,302,500
7	Park Conservation District Upper Yellowstone River Cumulative Effects Investigation	299,940	299,940	2,602,440
8	Toole County Toole County Plugging and Abandonment; Aid to Independent Small Oil Operators	300,000	300,000	2,902,440
9	Butte-Silver Bow Local Government Upper Clark Fork Basin: Superfund Technical Assistance	95,236	95,236	2,997,676
10	Fergus County Conservation District Central Montana Artesian Basin Groundwater Project	283,113	150,000	3,147,676
11	Toole County North Toole County Reclamation Project	300,000	150,000	3,297,676
12	Montana Tech of the University of Montana Champion International Gravel Pit Reclamation Project	88,230	88,230	3,385,906
13	Montana Department of Environmental Quality Implementing Nonpoint Source Management and Total Maximum Daily Loads (TMDLs)	300,000	214,000	3,599,906
14	University of Montana Department of Geology Remediation of Groundwater at Abandoned Mine Sites: Application of Permeable Reactive Wall Technology	256,266	198,866	3,798,722
15	Butte-Silver Bow Local Government Mining City Mineyard Preservation and Enhancement	297,104	297,104	4,095,876

16 Montana Department of Environmental Quality Wetland Inventory for Montana	300,000	300,000	4,395,876
17 Flathead County Board of County Commissioners Assessment of Aggregate Resources in Flathead and Missoula Counties	166,553	166,553	4,562,429
Jefferson County Water Quality and Quantity Management Improvement Project for Jefferson County	300,000	0	4,562,429
Lewistown, City of Source Location of Hazardous Organic Contaminants, Big Spring Creek Drainage	290,610	0	4,562,429
TOTAL REQUESTS	$5,579,552		

The minimum funding for RDGP is $3,000,000.

*The Montana Board of Oil and Gas Conservation has statutory priority for $600,000 in grant funds.

Figure 1 Reclamation and Development Grants Program
Location of Projects Recommended for Funding

Refer to Table 1 for identification of projects. Several projects are located in more than one county

(13) Statewide Project

(16) Statewide Project

▲ Board of Oil and Gas Conservation, Priority Projects

CHAPTER II

PROJECT ABSTRACTS, EVALUATIONS, AND RECOMMENDATIONS FOR THE 2001 BIENNIUM

These evaluations are based on review of the projects by the DNRC. The first 19 evaluations of recommended projects are presented in the order of their ranking. To find any particular evaluation quickly, just consult the alphabetical listing of projects by the names of the applicants on page v.

For projects recommended for RDGP funding, "TOTAL PROJECT COST" is the sum of "OTHER FUNDING AMOUNTS AND SOURCES" plus the "RECOMMENDED FUNDING" amount.

APPLICANT NAME: MONTANA BOARD OF OIL AND GAS CONSERVATION

PROJECT/ACTIVITY NAME: 1999 "A" Orphaned Well Plug and Abandonment and Site Restoration

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$ 25,463 Applicant

TOTAL PROJECT COST: $325,463

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The purpose of this grant request is to secure funding to plug and abandon 10 orphaned injection wells properly, and to perform the surface reclamation. The injection wells are of no further economic use, and similar wells have been plugged under the Reclamation and Development Grants Program (RDGP) in 1996 and 1997. The injection wells have the potential to cause damage to subsurface formations, the state's water, and the surface lands around each well.

The Board of Oil and Gas Conservation will eliminate the threat of contamination by soliciting bids to plug and abandon the injection wells. Under the supervision of the board's staff, the successful bidder will properly plug and abandon each injection well, dispose of and/or remediate contaminants, and reclaim the surface location.

The wells are water injection wells used to enhance oil production from the South East Cut Bank Sand Unit (SECBSU) in the past. The operators could no longer afford to produce the oil wells due to low oil prices; consequently, the oil wells and water injection wells were shut in. The companies' assets will not cover the liabilities to creditors, leaving the operators insolvent. Since the operators are currently insolvent, responsibility for the wells and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State of Montana. The injection wells will be properly plugged and abandoned when funding is made available.

The orphaned injection wells are located in SECBSU, Glacier County, Montana. In this case, all of the injection wells present a high potential to damage the environment because of pressure and the possibility of loss of mechanical integrity, which could cause the wells to flow into Cut Bank Creek. The wells border Cut Bank Creek on the east side and are within 0.5 mile of the creek. All wells, if a leak occurs, would flow to Cut Bank Creek.

The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.

TECHNICAL ASSESSMENT:

The 10 injection wells included in this application are located in Glacier County, Montana. Cut Bank Resources, Inc. drilled all 10 wells, mostly in the 1930s to 1940s. The wells are situated on natural prairie or cultivated farmland. Most of the injection wells are within one mile of Cut Bank Creek and have previously flowed water, oil, and/or gas to the surface. If left uncontrolled, these discharges would ultimately pollute Cut Bank Creek and the Marias River. Additionally, damage to the Eagle formation (a

water-bearing formation in the area) and local mineral- or gas-bearing formations is likely if the casing fails from either excess pressure or natural deterioration of the well casing. If the wells are left unplugged, the increase in well pressure or loss of mechanical integrity poses a direct threat to the environment and mineral resources.

Since Cut Bank Resources, Inc. is insolvent, the responsibility for the prevention and/or cleanup of surface water and groundwater contamination rests upon the State of Montana. All attempts by the Board of Oil and Gas Conservation (BOGC) to compel Cut Bank Resources, Inc. to remedy the well problems have failed. If these wells remain unplugged, leakage or blowout will occur, increasing the cost of state-conducted plugging and restoration considerably. Any spill or blowout would be considered a severe threat to human health and the environment. This project addresses the need to prevent damage to the human health and environment caused by unplugged or improperly plugged wells.

As in the case of the applicant's other application for RDGP funds ("B" Orphaned Well Plug and Abandonment, and Site Restoration), each well proposed for plugging has been evaluated and prioritized using the Well Plugging Prioritization System (WPPS). Developed by BOGC and RDGP relatively recently, WPPS increases measurably the likelihood that RDGP funds will be used for the worst contamination problems first. WPPS uses predetermined scoring criteria based on the wells mechanical condition and location, which are logical indicators of potential problems. Because RDGP is nonregulatory and under no statutory mandate to plug any and all unplugged wells (unlike the BOGC), grant funds may be used selectively to plug the holes most threatening to human health and the environment. Such an approach maintains consistency with RDGP program objectives. If the wells identified in the application are plugged for less than $300,000, then WPPS will be implemented to plug additional wells.

These wells, when plugged by BOGC, are likely never to be re-drilled for production or reinjection purposes. However, it is recommended that in the event they are, any future well operator be required to post bond commensurate with the amount of RDGP funding used to plug the well. A similar condition is imposed by the Montana Department of Environmental Quality (DEQ) relative to the state's reclamation of abandoned hard rock mines, and this condition seems appropriate here.

FINANCIAL ASSESSMENT:

The applicant requests the following in RDGP funds:

Contracted services (construction)	$ 300,000
Total	$ 300,000

Cost estimates submitted by BOGC for equipment, materials, and labor to plug these wells are reasonable and are based on many previous RDGP projects conducted by the applicant. Grant funds will be used to competitively bid well plugging until the funds are exhausted.

This grant, if approved, is part of the applicant's priority funding status found under Section 90-2-1113(2), MCA. This statute gives preference to the applicant for $600,000 for projects each biennium, if there are no funds remaining from previous bienniums. If funds do remain, the priority for this biennium will be reduced by the amount remaining from previous bienniums. At the time of this report (October 1, 1998), $600,000 in previous priority grant funds remains.

ENVIRONMENTAL EVALUATION:

No long-term adverse environmental impacts are expected as the result of the plugging and abandonment of the proposed wells, provided reclamation activities are conducted properly. Short-term adverse impacts associated with the movement of equipment to the sites are expected. Compacted soil and destroyed vegetation on access routes will be reclaimed upon project completion and any debris will be hauled off-site and disposed of in a licensed landfill. Short-term air pollution (e.g., dust and emissions from combustion engines) would be minimal provided that equipment and traffic routes are watered as necessary and mechanized equipment is in proper working condition. If the sites involve cleanup and disposal of drilling fluids, oil sludge, brine wastes, or other contaminants, these materials must be identified and characterized and this information used to develop site-specific reclamation plans. Depending on the material and contaminants encountered, remedial action may involve burning, burial, land farming, and addition of soil amendments for materials disposed of on-site, or it may involve hauling materials to a licensed off-site landfill or waste disposal facility. If a site poses unusual difficulty or necessitates remedial actions not normally implemented by BOGC, appropriate regulatory or reclamation experts would need to be contacted.

PUBLIC BENEFITS ASSESSMENT:

Improvement and protection of water, vegetation, and soil resources are the primary benefits of this project. These benefits will be realized mainly by area farmers and ranchers to an unknown extent. Waste of oil and gas reserves may also be prevented. Oil and gas plugging contractors, suppliers, and subcontractors will feel a moderate economic impact.

RECOMMENDATIONS:

A grant of up to $300,000 is recommended for this project, contingent upon DNRC approval of the project scope of work and budget and provided that the applicant has complied with the provisions of Section 90-2-1113 (2), MCA, regarding expenditures of priority funds received in previous bienniums. No funds are to be used for applicant staff salaries or fringe benefits or for operating expenses not directly tied to this grant project.

APPLICANT NAME: MONTANA BOARD OF OIL AND GAS CONSERVATION

PROJECT/ACTIVITY NAME: 1999 "B" Orphaned Well Plug and Abandonment, and Site Restoration

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$ 28,461 Applicant

TOTAL PROJECT COST: $328,461

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The purpose of this grant request is to secure funding to plug and abandon orphaned oil and gas and leaking orphaned abandoned wells properly, and perform the surface reclamation. The wells are uneconomic and have the potential to cause damage to subsurface formations, the state's water, and the

surface around each well.

The Board of Oil and Gas Conservation will eliminate the threat of contamination by soliciting bids to plug and abandon the wells. Under the supervision of the board's staff, the successful bidder will properly plug and abandon each well, dispose of and/or remediate contaminants, and reclaim the surface location.

The wells produced oil and/or gas and were improperly plugged in the past. The operators could no longer afford to produce, and the wells were shut in. The companies' assets will not cover the liabilities to creditors, leaving the operators insolvent. Since the operators are currently insolvent or long since defunct, responsibility for the wells and any potential environmental damage rests with the Board of Oil and Gas Conservation and the State of Montana. The wells will be properly plugged and abandoned when funding is made available.

The orphaned wells are located throughout Montana. In most cases, the wells that present the highest potential to damage the environment because of leaking or loss of mechanical integrity will be plugged first. The project is estimated to take 24 months. The work will generally begin during the first suitable field season following the availability of funding.

TECHNICAL ASSESSMENT:

This proposal requests funds to plug and abandon 11 oil and gas wells located in Stillwater (5 wells), Pondera (2 wells), Toole (2 wells), Musselshell (1 well), and Petroleum (1 well) Counties. Each of these wells poses a moderate threat to human health or the environment if left unplugged. One of the wells in Toole County is on state-owned land and has been referred to the applicant by the Trust Land Management Division of DNRC for inclusion in this proposal.

Plugging of all wells should not pose any unusual difficulty and will be carried out using standard equipment and procedures. If the 11 wells in this project can be plugged for less than the $300,000 estimated cost, additional problem wells will be prioritized and plugged. These additional wells will be screened and prioritized according to the severity of threat posed to human health and the environment using the state's Well Plugging Prioritization System (WPPS) developed by RDGP and BOGC.

FINANCIAL ASSESSMENT:

The applicant requests the following in RDGP funds:

Contracted services (construction)	$ 300,000
Total	$ 300,000

This grant, if approved, is part of the applicant's priority funding status found under Section 90-2-1113(2), MCA. This statute gives preference to the applicant for $600,000 for projects each biennium, if there are no funds remaining from previous bienniums. If funds do remain, the priority for this biennium will be reduced by the amount remaining from previous bienniums. At the time of this report (October 1, 1998), $600,000 in previous priority grant funds remains.

ENVIRONMENTAL EVALUATION:

No long-term adverse environmental impacts should be created in the plugging and abandonment of the proposed wells, provided reclamation activities are conducted properly. Short-term adverse impacts

associated with the movement of equipment to the sites are expected. Compacted soil and destroyed vegetation on access routes will be reclaimed upon project completion, and any debris will be hauled off-site and disposed of in a licensed landfill. Short-term air pollution (e.g., dust, emissions from combustion engines) would be minimal provided that equipment and traffic routes are watered as necessary and mechanized equipment is in proper working condition. If the sites involve cleanup and disposal of drilling fluids, oil sludge, brine wastes, or other contaminants, these materials must be identified and characterized and this information used to develop site-specific reclamation plans. Depending on the material and contaminants encountered, remedial action may involve burning, burial, land farming, and addition of soil amendments for materials disposed of on-site, or it may involve hauling materials to a licensed off-site landfill or waste disposal facility. If a site poses unusual difficulty or necessitates remedial actions not normally implemented by BOGC, appropriate regulatory or reclamation experts would need to be contacted.

PUBLIC BENEFITS ASSESSMENT:

Protection of groundwater and surface water coupled with conservation of oil and gas mineral benefit all Montanans. Long-term degradation of soil, water, vegetation, and cropland will be eliminated. Oil and gas plugging contractors, suppliers, and subcontractors will feel a moderate economic impact.

RECOMMENDATION:

A grant of up to $300,00 is recommended for this project contingent upon DNRC approval of the project scope of work and budget and provided that the applicant has complied with the provisions of section 90-2-1113 (2), MCA, regarding the expenditure of priority funds received in previous bienniums. This amount represents one half of the applicant's priority limitation.

PROJECT NO. 1

APPLICANT NAME: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PROJECT/ACTIVITY NAME: Silver Bow Creek, Streamside Tailings, Remedial Action #1

AMOUNT REQUESTED: $ 300,000 RECOMMENDED FUNDING: $300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$2,700,000 U.S. Environmental Protection Agency (EPA)

TOTAL PROJECT COST: $3,000,000

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The purpose of this project is to remove mill tailings from Silver Bow Creek. Tailings are the source of heavy metal (copper, zinc, lead, cadmium, arsenic, and mercury) contamination of surface water and groundwater occupying the 100-year floodplain of Silver Bow Creek. Downstream migration of metal-rich tailings from the Butte area contributes to fish kills and poses risk to human health and safety. Water

quality in Silver Bow Creek exceeds water quality standards listed in Water Quality Bureau - 7 (WQB-7). The U.S. Environmental Protection Agency (EPA) will contribute $5,400,000 to the first phase of a cleanup along Silver Bow Creek. However, EPA requires the State of Montana to contribute 10 percent in matching funds for the project. The Department of Environmental Quality (DEQ) is requesting two Reclamation and Development Grants of $300,000 each, to guarantee the $5,400,000 contribution from EPA for remediation of Silver Bow Creek. This 10 percent state match of EPA funding will encumber necessary federal funds for use on this Montana Superfund site. If not encumbered, the federal dollars may be obligated to an out-of-state EPA Superfund project.

The primary objective of this project is to remove metal-rich tailings from Silver Bow Creek and encapsulate them in a repository, isolating them from air and water. All disturbed areas would be regraded, topsoiled, and revegetated. When the above tasks are completed, migration of and potential exposure to the tailings will be eliminated. The site will once again support native vegetation and productive aquatic life (western cutthroat trout and microinvertebrates).

The Montana Mine Waste Cleanup Bureau of the Montana Department of Environmental Quality will be the organization responsible for conducting this reclamation project.

Silver Bow Creek is 26 miles long, originating on Butte Hill in Silver Bow County, Montana, and terminating into the Warm Spring Ponds, Deer Lodge County, Montana. The site is located in Townships 8, 9, and 10 West, Ranges 3, 4, and 5 North, Silver Bow and Deer Lodge Counties, Montana. This phase of the construction will take place in Sections 22 and 23, Township 8 West, Range 3 North, Silver Bow County, Montana.

Project construction should be completed within 200 consecutive calendar days.

TECHNICAL ASSESSMENT:

DEQ has proposed this grant project to allow it and EPA to continue Superfund cleanup actions on Silver Bow Creek expeditiously. The responsibility for funding these cleanup actions ultimately lies with the Atlantic Richfield Company (ARCO), the potentially responsible party (PRP) for the streamside tailings operable unit of the Silver Bow Creek Superfund site. If this grant is not awarded, DEQ will be unable to provide the state cost share required by EPA for the agencies to implement the action immediately. The overall cleanup may be delayed in that instance.

Volumes of design documents and assessment work dealing with removal of the tailings from the stream channel support the project's technical feasibility and have been scrutinized through a public review and comment process. The cleanup alternative chosen (removal and disposal of contaminated tailings in a repository) is technically sound.

If this grant is approved, DEQ anticipates that it would be able to repay the entire award to DNRC upon settlement of litigation addressing ARCO's liability and the recovery of EPA's and DEQ's costs for conducting the cleanup. Settlement discussions are currently underway (October 1998) with ARCO to resolve these issues.

If a settlement with ARCO is consummated and provides funding to DEQ prior to the start of cleanup actions proposed to be funded under these grants, DEQ will withdraw its grant applications and conduct the work with the ARCO funds. This would free up the $600,000 requested, which could be used for other RDGP projects.

FINANCIAL ASSESSMENT:

By statute, DEQ would use funds from the hazardous waste/Comprehensive Environmental Response Compensation and Liability Act (CERCLA) special revenue account established under section 75-10-621, MCA, to obtain federal (EPA) matching funds available for this cleanup. This account, however, currently does not contain sufficient funds above current appropriations to pay for the proposed streamside tailings remedial action.

The $600,000 requested represents 10 percent of the projected $6 million cost of cleanup. Two RDGP grants are being requested to meet the $600,000 cost share required for this phase of remedial action along the Silver Bow Creek streamside corridor.

ENVIRONMENTAL EVALUATION:

Construction activities associated with the streamside remedial action would pose short-term impacts to area soils; vegetation; surface water and groundwater resources; and terrestrial, avian, and aquatic species and habitats. Workers should wear appropriate protective equipment on site and be trained in proper operation, including safety measures required by hazardous waste handling regulations. The repository proposed for the disposal of contaminated wastes will have no major, long-term environmental impact if it is monitored, properly maintained, and functioning as intended.

PUBLIC BENEFITS ASSESSMENT:

The project protects public health and safety by eliminating potential human contact with contaminated soils, tailings, and water. Public water resources will be enhanced, and short-term economic benefit will be realized due to construction payrolls. Long-term economic benefits will eventually result from increased recreational use of the entire 26-mile-long stream corridor.

RECOMMENDATION:

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget. Any costs of cleanup recovered from potentially responsible parties by DEQ or EPA shall be returned to DNRC's Reclamation and Development Grants Program.

PROJECT NO. 2

APPLICANT NAME: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PROJECT/ACTIVITY NAME: Silver Bow Creek, Streamside Tailings, Remedial Action #2

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$2,700,000 U.S. Environmental Protection Agency (EPA)

TOTAL PROJECT COST: $3,000,000

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The purpose of this project is to remove mill tailings from Silver Bow Creek. Tailings are the source of heavy metal (copper, zinc, lead, cadmium, arsenic, and mercury) contamination of surface water and groundwater occupying the 100-year floodplain of Silver Bow Creek. Downstream migration of metal-rich tailings from the Butte area contributes to fish kills and poses risk to human health and safety. Water quality in Silver Bow Creek exceeds water quality standards listed in Water Quality Bureau - 7 (WQB-7). The U.S. Environmental Protection Agency (EPA) will contribute $5,400,000 to the first phase of a cleanup along Silver Bow Creek. However, EPA requires the State of Montana to contribute 10 percent in matching funds for the project. The Department of Environmental Quality (DEQ) is requesting two Reclamation and Development Grants of $300,000 each, to guarantee the $5,400,000 contribution from EPA for remediation of Silver Bow Creek. This 10 percent state match of EPA funding will encumber necessary federal funds for use on this Montana Superfund site. If not encumbered, the federal dollars may be obligated to an out-of-state EPA Superfund project.

The primary objective of this project is to remove metal-rich tailings from Silver Bow Creek and encapsulate them in a repository, isolating them from air and water. All disturbed areas would be regraded, topsoiled, and revegetated. When the above tasks are completed, migration of and potential exposure to the tailings will be eliminated. The site will once again support native vegetation and productive aquatic life (western cutthroat trout and microinvertebrates).

The Montana Mine Waste Cleanup Bureau of the Montana Department of Environmental Quality will be the organization responsible for conducting this reclamation project.

Silver Bow Creek is 26 miles long, originating on Butte Hill in Silver Bow County, Montana, and terminating into the Warm Spring Ponds, Deer Lodge County, Montana. The site is located in Townships 8, 9, and 10 West, Ranges 3, 4, and 5 North, Silver Bow and Deer Lodge Counties, Montana. This phase of the construction will take place in Sections 22 and 23, Township 8 West, Range 3 North, Silver Bow County, Montana.

Project construction should be completed within 200 consecutive calendar days.

TECHNICAL ASSESSMENT:

DEQ has proposed this grant project to allow it and EPA to continue Superfund cleanup actions on Silver Bow Creek expeditiously. The responsibility for funding these cleanup actions ultimately lies with the Atlantic Richfield Company (ARCO), the potentially responsible party (PRP) for the streamside tailings operable unit of the Silver Bow Creek Superfund site. If this grant is not awarded, DEQ will be unable to provide the state cost share required by EPA for the agencies to implement the action immediately. The overall cleanup may be delayed in that instance.

Volumes of design documents and assessment work dealing with removal of the tailings from the stream channel support the project's technical feasibility and have been scrutinized through a public review and comment process. The cleanup alternative chosen (removal and disposal of contaminated tailings in a repository) is technically sound.

If this grant is approved, DEQ anticipates that it would be able to repay the entire award to DNRC upon

settlement of litigation addressing ARCO's liability and the recovery of EPA's and DEQ's costs for conducting the cleanup. Settlement discussions are currently underway (October 1998) with ARCO to resolve these issues.

If a settlement with ARCO is consummated and provides funding to DEQ prior to the start of cleanup actions proposed to be funded under these grants, DEQ will withdraw its grant applications and conduct the work with the ARCO funds. This would free up the $600,000 requested, which could be used for other RDGP projects.

FINANCIAL ASSESSMENT:

By statute, DEQ would use funds from the hazardous waste/Comprehensive Environmental Response Compensation and Liability Act (CERCLA) special revenue account established under section 75-10-621, MCA, to obtain federal (EPA) matching funds available for this cleanup. This account, however, currently does not contain sufficient funds above current appropriations to pay for the proposed streamside tailings remedial action.

The $600,000 requested represents 10 percent of the projected $6 million cost of cleanup. Two RDGP grants are being requested to meet the $600,000 cost share required for this phase of remedial action along the Silver Bow Creek streamside corridor.

ENVIRONMENTAL EVALUATION:

Construction activities associated with the streamside remedial action would pose short-term impacts to area soils; vegetation; surface water and groundwater resources; and terrestrial, avian, and aquatic species and habitats. Workers should wear appropriate protective equipment on site and be trained in proper operation, including safety measures required by hazardous waste handling regulations. The repository proposed for the disposal of contaminated wastes will have no major, long-term environmental impact if it is monitored, properly maintained, and functioning as intended.

PUBLIC BENEFITS ASSESSMENT:

The project protects public health and safety by eliminating potential human contact with contaminated soils, tailings, and water. Public water resources will be enhanced, and short-term economic benefit will be realized due to construction payrolls. Long-term economic benefits will eventually result from increased recreational use of the entire 26-mile-long stream corridor.

RECOMMENDATION:

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget. Any costs of cleanup recovered from potentially responsible parties by DEQ or EPA shall be returned to DNRC's Reclamation and Development Grants Program.

PROJECT NO. 3

APPLICANT NAME: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PROJECT/ACTIVITY NAME: Toston Smelter Reclamation Project

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$300,000 Applicant

TOTAL PROJECT COST: $600,000

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The purpose of this project is to address human health and safety hazards associated with exposed and accessible, heavy-metals-contaminated slag, waste rock, tailings, and soil at the Toston Smelter. The smelter site was utilized for processing Radersburg-area ores from 1885 until 1890, when the site was abandoned. The site covers approximately 2 acres and is contaminated with high levels of arsenic, lead, and iron. Water sampling indicates contaminant migration off-site. Contaminated soil and water have affected trees, grass, and shrubs, which have all succumbed to heavy metal poisoning. As a result, much of the site is devoid of any kind of vegetation.

The primary objectives of this project are to remove solid media contaminant sources at the Toston Smelter that exhibit hazardous waste characteristics and dispose of these wastes in a repository/landfill. All mine-disturbed areas would be regraded, topsoiled, and revegetated. When these tasks are completed, heavy metals exposure and migration will be eliminated. Water quality will be improved, and the site will again be able to support a stand of native vegetation species.

The Mine Waste Cleanup Bureau (MWCB) of the Montana Department of Environmental Quality will be the organization responsible for conducting this reclamation project.

The Toston Smelter is located approximately 1 mile south of the town of Toston. The site is located in Section 26, Township 5 North, Range 2 East, Broadwater County, Montana.

Project construction should be completed within 60 consecutive calendar days.

TECHNICAL ASSESSMENT:

The application states that solid media contaminant sources will be disposed of in a repository or landfill and that all disturbed areas will be graded, topsoiled, and revegetated. A number of other alternatives could potentially also be implemented at the Toston Smelter site. The ultimate selection of the appropriate reclamation alternative/repository will depend on (1) the nature of the waste material,(2) the concentration of contaminants, (3) the quantity of waste material, and (4) whether the alternative meets applicable or relevant and appropriate regulations (ARARs). At present, no initial screening of potential cleanup technologies and process options, screening of alternatives, or detailed analysis of alternatives has been conducted. The following alternatives deserve further analysis.

1. Institutional controls
2. In-place containment
3. Consolidation/containment
4. Excavation and on-site disposal in a modified Resource Conservation and Recovery Act (RCRA) repository

5. Partial excavation/disposal in a modified RCRA repository
6. Excavation and disposal off site at a Montana Class II Municipal Solid Waste (MSW) landfill or a RCRA hazardous waste landfill

Each of these alternatives is fairly typical of solid media (waste rock, tailings, and soils) mine cleanups and has been implemented by DEQ at other sites many times in the past.

The type of repository (from a minimal cap, all the way to a regulated RCRA Subtitle C repository) would primarily depend on (1) the concentration of metals in the waste material, (2) the type of waste material, (3) the presence and amount of surface water, (4) the future land use of the site, (5) regulatory exemptions, and (6) a TCLP (toxicity characteristics leaching procedure) criteria test that determines whether a contamination is hazardous and therefore must be disposed of in a permitted hazardous waste facility.

The proposed Engineering Evaluation/Cost Analysis (EE/CA) now in preparation (October 1998) should address these alternatives in detail and potentially others, depending on the types of wastes present and results of extensive and more detailed risk assessments now being conducted. The EE/CA will also present a thorough and accurate estimate of the cost for each alternative, something this proposal does not do. Cost comparisons and degree-of-risk-reduction comparisons for several alternatives are not addressed in the application.

The cleanup will be conducted according to federal Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and state Comprehensive Environmental Cleanup and Responsibility Act (CECRA) specifications and will likely meet the expectations for cleanups that address removal/disposal of the solid media wastes only. The aqueous media is not addressed, although removing or containing solid wastes may eliminate the need for more expensive treatment of surface water and/or groundwater later. A proven state-of-the-art removal action for the solid media is most cost-effective now, until technologies treating groundwater and surface water become reliable and affordable.

Reduction of arsenic, lead, and iron mobility at this site is a needed action to help mitigate the threats to human health and the environment posed by this site. It is ranked ninth on Montana's list of 282 mines needing cleanup.

FINANCIAL ASSESSMENT:

The requested RDGP funds are for:

Contracted services	$300,000
TOTAL	$300,000

All funds would go toward construction. This amount is a preliminary construction estimate only and may increase substantially, depending on the results of the EE/CA investigation. Individual work items and costs have not yet been prepared, making the budget difficult to evaluate. The $300,000 estimate is derived from preliminary material quantity and waste volume estimates made during site characterization fieldwork activities. There is no reason to suspect that the cost of cleanup is less than the requested amount. If the total estimated cost of cleanup is less than $600,000, however, reduction of RDGP funds should be considered.

ENVIRONMENTAL EVALUATION:

It is anticipated that construction activities related to the implementation of this project would be completed in a single field season. Therefore, impacts associated with construction activities would be considered short-term and should not significantly impact human health or the environment. Following a site-specific health and safety plan, employing appropriate personal protective equipment, and following proper operating and safety procedures would protect on-site workers. However, short-term air quality impacts to the immediate environment may occur due to the relatively large volume of waste excavation and hauling. Control of fugitive dusts may thus require the use of water sprays. The only foreseen short-term impact to the surrounding community would involve increased vehicle traffic, with associated safety hazards, emissions, and dust generation.

PUBLIC BENEFITS ASSESSMENT:

Reclamation of the Toston Smelter will eliminate contamination migration off-site. This will have a positive impact on Missouri River water quality, which is a public resource. This project will address human health and safety risks associated with heavy metals contamination at the site. The project will eliminate the possibility of human contact with contaminated slag, soils, waste rock, and tailings. The project will also reduce or eliminate the possibility of human contact with water-borne heavy metal contamination. This project will provide direct economic benefits to engineering companies, construction contractors, project material vendors, and their employees. Heavy equipment parts suppliers, fuel distributors, local stores, and restaurants will realize indirect economic impacts.

RECOMMENDATION:

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

PROJECT NO. 4

APPLICANT NAME: CITY OF TOWNSEND

PROJECT/ACTIVITY NAME: East Pacific Mine Reclamation

AMOUNT REQUESTED: $202,500 RECOMMENDED FUNDING: $202,500

OTHER FUNDING AMOUNTS AND SOURCES:

$ 47,000	U.S. Forest Service
$ 2,000	Montana Department of Fish, Wildlife and Parks
$ 1,000	Applicant

TOTAL PROJECT COST: $252,500

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The East Pacific Mine is located on private and federal land in Broadwater County approximately 18 miles

southeast of Helena, Montana (Sections 26 and 27Township 8 North, Range 1 West,). The portion on federal land is located in NE1/4, SW1/4, Section 26 Township 8 North, Range 1 West. The historical mine and mill operations at the East Pacific Mine site have significantly degraded the environmental setting and have caused downstream impacts. Based on scientific studies, data suggest that the site may pose a threat to human health and safety and, more likely, to sensitive ecosystems of the adjoining riparian zone and to Spring Creek, Weasel Creek, and Beaver Creek, a tributary to Canyon Ferry Reservoir.

The fact that this site is located within and adjacent to Spring Creek and its floodplain provides the need and urgency for reclamation. A short distance (1/4 mile) downstream, Spring Creek empties into Weasel Creek, a barren watercourse due to past mining impacts. Two miles away, it drains into Beaver Creek, which contains a viable fish population and is a tributary to Canyon Ferry Reservoir. Beaver Creek is important habitat for westslope cutthroat trout, a sensitive species. Both permanent and seasonal residences are located up and down these drainages. The closest is a seasonal residence with a well located a few hundred feet from the mine site.

Numerous studies and analyses have been conducted at the East Pacific Mine site to detect environmental impacts of and risks to soils, sediments, tailings, and water quality, as well as plant and animal life. The studies' conclusions are that heavy metals in mill tailings, waste rock dumps, and surface water represent a significant long-term risk to the aquatic resources of the Spring Creek, Weasel Creek, and Beaver Creek drainages, as well as a concern to public health and safety. Removal and stabilization of the tailings and waste rock would significantly reduce the risks posed by these conditions.

In 1997, the Mine Waste Cleanup Bureau of the Montana Department of Environmental Quality contracted the preparation of an Engineering Evaluation and Cost Analysis (EE/CA) to analyze the reclamation of the whole East Pacific Mine site (private and federal land). The EE/CA will address several remedial actions to deal with the tailings and waste rock, totaling 88,500 cubic yards of waste, of which approximately 31,400 cubic yards are on federal land.

The specific project being proposed for DNRC grant funding is to eliminate potential environmental and public health risks posed by the high concentrations of heavy metals in the tailings pile and waste rock dumps #4 and #5 located on federal land. Specific objectives include:

1. Prevent human, wildlife, and aquatic life that use the area from being exposed to the high concentrations of metals
2. Prevent contaminated wastes from affecting the adjacent riparian zone and from migrating into adjacent surface water and groundwaters
3. Avoid unintended environmental consequences during and after the removal and stabilization actions
4. Comply with Applicable or Relevant and Appropriate Requirements (ARARs) to the extent practical

Securing the historical integrity of the mill building and site monitoring would be accomplished as well. This project would begin in July 1999 and last about two months.

Although the Helena National Forest is administering the federal land, various agencies have been involved in efforts to address environmental risks over the years. These agencies include the Montana Department of Environmental Quality, and the U. S. Forest Service (USFS).

TECHNICAL ASSESSMENT:

The East Pacific Mine site ranks 22nd on the DEQ's *Abandoned Hardrock Mine Priority Sites Summary Report* (updated February 1998). This report is a compilation and characterization of Montana's abandoned hard rock mines according to the severity of contamination/environmental problems occurring on the sites. Prepared as the result of input from federal and state agencies, it is one of several tools RDGP uses to rank and prioritize mine cleanup projects submitted for grant funding each biennium.

The greatest risks to human health and the environment at the East Pacific Mine site are the mill tailings and waste rock piles via direct contact, surface water, and air exposure pathways. Based on an in-depth risk assessment conducted by DEQ, arsenic in the tailings is the principal contaminant of concern (COC) for human health, while arsenic, cadmium, copper, lead, and zinc are the principal COCs for ecological exposure. The tailings and waste rock are located in the Spring Creek drainage. The waste piles are subject to erosion and infiltration of water, which contribute to increased metal levels in surface water. Removal of the tailings and waste rock from the drainage to an engineered repository would provide protection from erosion and infiltration with a high degree of overall risk reduction. A repository should be located well away from surface water drainage, and the fine rock fraction of the waste rock material should be placed in the repository, thereby decreasing airborne particulate risk. The coarse waste rock would be regraded, topsoiled, and revegetated. Other reclamation options include no action, institutional controls, consolidation/in-place containment; and disposal in a RCRA-regulated off-site repository. Either these options do not result in any significant reduction in risk to human health or the environment, or they are cost-prohibitive.

Repository construction, reconstruction of drainage ways, and revegetation involve straightforward construction techniques and present no unusual difficulty. Gravity screening of the waste rock fine material will require specific equipment and construction expertise. The construction is complicated by steep terrain, which will require consideration in both design and implementation of tasks. Key personnel from federal and state cleanup agencies will be available on site throughout construction and will provide the necessary oversight for successful execution of bid plans and specifications. The project conforms well to RDGP program objectives and is an appropriate use of grant funds.

FINANCIAL ASSESSMENT:

The application lists the following budget for cleanup at the East Pacific Mine.

Salaries and wages	$ 1,500
Contracted services	$201,000
TOTAL	$202,500

The above budget is for cleanup of wastes on federal land only.

However, the entire site is a mix of private and federal ownership and has been examined in detailed EE/CA documents being prepared by DEQ. The estimated cost of cleanup of the solid media for the entire site is $1.4 million. All financial partners need to combine financial resources and expertise to implement the most cost-effective cleanup for the entire site. Indications are that DEQ will begin construction during the 1999 field season, allowing ample time for needed coordination and scheduling of the project between agencies. Although not expected, if the repository is located on federal land, the possibility exists that USFS will not allow disposal of wastes from non-federal land in the repository. In that event, the cleanup would be piecemeal and significantly less cost-effective.

The total cost of cleanup for the entire site is estimated using bid tabulations and unit costs from similar

RDGP-funded mine cleanups (Vosburg Mine and Whites Gulch Project) in the surrounding area and is reasonable for the work items identified. Both of these previous projects exemplify interagency (federal, local, and state) cooperation and coordination. The Townsend Ranger District of the Helena National Forest is extremely well suited and qualified to assist and oversee this cleanup. At the federal level, this district is the front runner in the field of hard rock mine reclamation in Montana.

ENVIRONMENTAL EVALUATION:

This project would reduce contaminant mobility at the site by removing the highest risk solid media contaminant sources and disposing of these wastes in an engineered repository. The tailings and the finer waste rock fraction (approximately 3-inch minus) would be encapsulated in an engineered repository that would effectively isolate this waste and reduce contaminant mobility. The remaining coarse waste rock, which consists primarily of non-mineralized, unaltered andesitic country rock, would be graded to stable slope in areas outside of the reconstructed Spring Creek stream channel/floodplain and contoured to mimic natural talus slopes. Periodic inspections and maintenance would ensure the long-term stability of the repository.

It is anticipated that construction activities related to the implementation of this project would be completed in a single field season. Therefore, impacts associated with construction activities would be considered short-term and should not significantly impact human health or the environment. Following a site-specific health and safety plan, employing appropriate personal protective equipment, and following proper operating and safety procedures would protect on-site workers. However, short-term air quality impacts to the immediate environment may occur due to the relatively large volume of waste excavation and hauling. Control of fugitive dusts may thus require the use of water sprays. Short-term impacts to the surrounding community are expected to be minimal due to the location of the project site. The only foreseen short-term impact to the surrounding community would involve increased vehicle traffic, with associated safety hazards and dust generation.

PUBLIC BENEFITS ASSESSMENT:

Protection of human health would be achieved to the maximum extent possible, using the background concentration of arsenic as the maximum achievable cleanup goal. Placing the wastes into a repository would prevent exposure by direct contact. Arsenic exposure via the soil ingestion/dust inhalation pathway would be reduced to levels consistent with the background concentration, which would achieve reclamation goals. Cleanup below background concentrations is not considered achievable. Ingestion exposure to zinc via ingestion of contaminated fish is expected to be reduced below risk-based cleanup goals since further erosion of contaminated sediments in to Spring Creek would be prevented. Arsenic exposure via the water/fish ingestion pathway would be reduced to levels consistent with the background water quality above the mine site.

Protection of the environment would generally be achieved under this project. Prevention of ecological exposures via exposure to water, sediment, and soil sources would be achieved to the extent practicable. The following would be reduced to risk-based cleanup goals:

1. Deer exposure to lead via ingestion of tailings salts
2. Plant phytotoxicity to arsenic, cadmium, copper, lead, and zinc
3. Acute exposure of aquatic life to cadmium and zinc
4. Aquatic life exposure to arsenic, cadmium, lead, and zinc via sediment

Since the waste sources would be removed from Spring Creek, cadmium and zinc levels in the surface water would be reduced to levels consistent with background concentrations. Similarly, arsenic, cadmium, lead, and zinc concentrations in sediments would be reduced as they are diluted either by mixing with natural sediment or through bed load dispersion downstream. Moderate economic benefits will be realized by local and area business, suppliers, and contractors.

RECOMMENDATION:

A grant of up to $202,500 is recommended for this project contingent upon DNRC approval of the scope of work and budget. The applicant must schedule and coordinate this project cleanup to coincide with the East Pacific Mine cleanup to be conducted by DEQ. Otherwise, no funding is recommended.

PROJECT NO. 5

APPLICANT NAME: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PROJECT/ACTIVITY NAME: Frohner Mine Reclamation Prject

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$200,000 Applicant

TOTAL PROJECT COST: $500,000

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The purpose of this project is to address human health and safety hazards associated with exposed and accessible, heavy-metals-contaminated waste rock and soil at the Frohner Mine. The Frohner Mine harbors an estimated 12,000 cubic yards of waste rock and two discharging mine adits. Site waste sources contain significantly elevated levels of arsenic, copper, mercury, lead, and antimony. Site surface water and groundwater degradation has been documented. Water sampling clearly indicates contaminant migration off-site. Contaminated soil and water have affected trees, grass, and shrubs, which have all succumbed to heavy metal poisoning. As a result, much of the site is devoid of any kind of vegetation.

The primary objectives of this project are to remove solid media contaminant sources at the Frohner Mine that exhibit hazardous waste characteristics and dispose of these wastes in a constructed repository. Site surface water would be isolated from contact with contaminated mine wastes, and all mine-disturbed areas would be regraded, topsoiled, and revegetated. When these above tasks are completed, heavy metals exposure and migration will be significantly reduced or eliminated. Water quality will be improved, and the site will again be able to support a stand of native vegetation species.

The Mine Waste Cleanup Bureau of the Montana Department of Environmental Quality will be the organization responsible for conducting this reclamation project.

The Frohner Mine is located approximately 14 miles southwest of Helena. The site is located in Section 15, Township 8 North, Range 5 West, Jefferson County, Montana.

Project construction should be completed within 60 consecutive calendar days.

TECHNICAL ASSESSMENT:

The Frohner Mine is an abandoned hardrock mine ranked 72nd on Montana's *Abandoned Hardrock Mine Priority Sites Summary Report* (updated February 1998). This listing of 282 sites throughout Montana contains abandoned hardrock mine sites ranked according to the severity of contamination threats to human health or the environment existing in groundwater, surface water, air, and direct contact exposure pathways. It also provides information on the volume of waste, contaminant concentrations, observed releases of contaminants to surface water and groundwater, water quality criteria exceedances, and safety hazards that occur at each site.

Arsenic, lead, copper, mercury, and antimony are found at the Frohner Mine in concentrations that are threats to both human health and the environment. A more detailed characterization of the site is now in progress (October 1998) and will lead to preparation of an engineering evaluation and cost analysis (EE/CA) report expected sometime in late fall 1998. The EE/CA will analyze feasible reclamation cleanup alternatives on the basis of short-term effectiveness, ability to protect human health and the environment, compliance with federal and state cleanup regulations and standards, long-term effectiveness, reduction of toxicity, mobility of volume of contamination, implementability, and cost in order to select a preferred reclamation alternative. It is a standard document used in federal CERCLA and state CECRA mine cleanups.

RDGP will review this document and subsequent preparation of bid plans and specifications by DEQ. For now, however, the application and supporting documents reviewed by RDGP present sufficient justification for a favorable funding recommendation. No funds should be released without DNRC approval of the preferred reclamation alternative prior to the preparation of bid plans and specifications.

FINANCIAL ASSESSMENT:

Contracted services	$ 300,000
TOTAL	$ 300,000

The RDGP funds requested are all for construction in the amount of $300,000. Although costs are not precisely detailed in the application, DEQ estimates that the total cost of the project is $500,000. This amount is estimated based on the location, type, and quantity of waste at the site and probable containment of wastes in an on-site repository. RDGP funding would cover over half of this amount. An itemized construction task estimate will available after the EE/CA is completed in fall 1998.

ENVIRONMENTAL EVALUATION:

It is anticipated that the construction would be accomplished in one field season; therefore, impacts associated with construction would be short-term and minimal. On-site workers would be adequately protected during the construction phase by following a site-specific health and safety plan, using appropriate personal protective equipment, and following proper operating and safety procedures. However, short-term air quality impacts to the surrounding environment may occur due to the large volumes of waste requiring excavation and transportation. Applying water (via water truck) would control fugitive dust to surfaces receiving heavy vehicular traffic, in excavation areas, etc. Short-term impacts to

the surrounding community are not expected to be significant due to the remote location of the project site and the small resident population.

PUBLIC BENEFITS ASSESSMENT:

Reclamation of the Frohner Mine site will significantly reduce or eliminate contaminant migration off-site; eliminate the possibility of human contact with contaminated soils, waste rock, water, and tailings; and stabilize hazardous slopes and rock piles. Direct benefits will accrue to the environment, recreationists, and contractors/consultants hired to perform the reclamation. Surrounding property (public and private) will also be enhanced, as will area wetlands and the water quality of Lump Gulch Creek.

RECOMMENDATION:

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

PROJECT NO. 6

APPLICANT NAME: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PROJECT/ACTIVITY NAME: Great Republic Smelter Reclamation Project

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$300,000 Applicant

TOTAL PROJECT COST: $600,000

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The purpose of this project is to address human health and safety hazards associated with exposed and accessible, heavy-metals-contaminated slag, waste rock, and soil at the Great Republic Smelter Site. The smelter site was utilized for processing Cooke City area ores from 1883 until 1890, when the smelter site was abandoned. The site covers approximately 2 acres and is contaminated with high levels of arsenic, cadmium, copper, iron, mercury, manganese, lead, antimony, and zinc. Water sampling indicates contaminant migration off-site. Contaminated soil and water have affected trees, grass, and shrubs, which have all succumbed to heavy metal poisoning. As a result, much of the site is devoid of any kind of vegetation.

The primary objectives of this project are to remove solid media contaminant sources at the Great Republic Smelter Site that exhibit hazardous waste characteristics and dispose of these wastes in a repository/landfill. All mine-disturbed areas would be regraded, topsoiled, and revegetated. When these tasks are completed, heavy metals exposure and migration will be eliminated. Water quality will be improved, and the site will again be able to support a stand of native vegetation species.

The Mine Waste Cleanup Bureau of the Montana Department of Environmental Quality will be the organization responsible for conducting this reclamation project.

The Great Republic Smelter site is located approximately 0.25 mile south of Cooke City. The site is located in Section 25, Township 9 South, Range 14 East, Park County, Montana.

Project construction should be completed within 60 consecutive calendar days.

TECHNICAL ASSESSMENT:

The site covers approximately 2 acres and harbors exposed and accessible heavy-metals-contaminated slag, waste rock, tailings, and soil. Site contamination consists of high levels of arsenic, cadmium, copper, iron, mercury, manganese, lead, antimony and zinc. Heavy-metals-contaminated slag rests directly in the stream channel of Woody Creek and is clearly migrating off-site. Contaminated soil and water have affected trees, grass, and shrubs, which have all succumbed to heavy metal poisoning. Much of the site is devoid of any kind of vegetation.

A human health risk assessment completed by DEQ for the Great Republic Smelter site evaluated contaminants and their potential impacts on human health. High concentrations of metals and arsenic are present in waste materials on-site (slag, tailings, and waste rock), and elevated concentrations of metals and arsenic are found in both groundwater and surface water. The easily accessible and erodable waste materials, if not remediated, present significant, negative, health-related consequences to the human population.

Implementation of this reclamation project should provide dramatic risk reduction to human health and the ecological community (aquatic organisms, vegetation, and wildlife) at the Great Republic Smelter site. In-place containment of waste materials and/or disposal in a repository are likely actions for the prevention of contaminant migration. Which option is more cost-effective, or whether a combination of both options is preferred for cleanup, is presently under study.

The site ranks as the 29th worst site in Montana's listing of contaminated, abandoned mines. An EE/CA will be completed for the Great Republic Smelter in late fall 1998. This document will provide a detailed analysis regarding selection of a preferred reclamation alternative for implementation of cleanup activities.

RDGP's ranking of this site is lower than the other DEQ mine reclamation projects submitted during the current cycle. The fact that contaminated material lies within the stream channel and alluvium of Woody Creek raises concerns and may require special handling/disposal methods. Also, the preferred alternative for cleanup may involve measures not yet addressed in the ongoing investigation. Compounding this uncertainty is the possibility of federally funded projects in the surrounding area, their scheduling, and the possibility that federal agencies may incorporate the Great Republic Smelter site into their planning and cleanup efforts.

FINANCIAL ASSESSMENT:

Contracted Services	$ 300,000
TOTAL	$ 300,000

The applicant is requesting $300,000, equal to one-half of the estimated total cost. Based on volume calculations of waste materials on the site and costs of similar cleanups conducted by DEQ in the recent past, the costs are reasonable. All RDGP funds would be used for construction and awarded to the lowest qualified bidder.

ENVIRONMENTAL EVALUATION:

It is anticipated that construction related to the implementation of this project would be completed in a single field season. Therefore, impacts associated with construction activities would be considered short-term and should not significantly impact human health nor the environment. Following a site-specific health and safety plan, employing appropriate personal protective equipment, and following proper operating procedures would protect on-site workers. However, short-term air quality impacts to the immediate environment may occur due to the relatively large volume of waste excavation and hauling. Control of fugitive dusts may thus require the use of water sprays. The predictable short-term impacts to the surrounding community would involve increased vehicle traffic with associated safety hazards, emissions, and dust generation.

PUBLIC BENEFITS ASSESSMENT:

Site hazards and contamination both on- and off-site will be reduced or eliminated. Public water resources will be enhanced. Aesthetic beauty will be restored to the landscape, and contractors, consultants, and area businesses will realize a short-term economic benefit.

Other benefits include increased recreational use of the site because of water quality improvements in Woody Creek.

RECOMMENDATION:

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

PROJECT NO. 7

APPLICANT NAME: PARK CONSERVATION DISTRICT

PROJECT/ACTIVITY NAME: Upper Yellowstone River Cumulative Effects Investigation

AMOUNT REQUESTED: $299,940 RECOMMENDED FUNDING: $299,940

OTHER FUNDING AMOUNTS AND SOURCES:

$120,940	U.S. Geological Survey - Montana
$ 30,000	U.S. Geological Survey - Colorado
$ 30,000	Federal Emergency Management Agency
$ 22,500	U.S. Natural Resources Conservation Service
$ 96,500	State and federal (in-kind)
$ 40,000	Seeking funding

TOTAL PROJECT COST: $639,880

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The Upper Yellowstone River and its floodplain support a variety of important domestic, agricultural, and recreational uses. The recent floods of 1996 and 1997 have accelerated bank erosion in some areas, introduced large amounts of gravel into the channel, and reduced the overall stability of the channel in some segments. In response, individual landowners most affected by the flood damage have proposed remedial channel modifications to reduce erosion and protect their resources. Concern about the effects of these and other possible future channel modifications led to the creation of the Governor's Upper Yellowstone River Task Force in November 1997. The task force has provided a public forum for a diverse group of watershed and river users to discuss river channel problems and potential solutions. Permitting agencies and many individuals involved in the process agree that a comprehensive investigation of the cumulative effects of river channel modifications is needed to ensure that the best long-term solutions to problems are developed.

This investigation would (1) develop tools for the analysis of cumulative effects of river channel modifications, (2) inventory channel and floodplain resources potentially affected by channel modifications, and (3) evaluate cumulative effects of proposed channel modifications on the channel and floodplain resources. Information developed as part of this investigation would also provide a quantitative framework for monitoring of cumulative effects.

In Phase I, data will be collected and analyzed on river channel processes over an 80-mile segment (valley miles) of the Yellowstone River between Gardiner and Springdale, Montana. In the first phase, information on historical river channel changes, river hydraulics, and sediment transport will be collected and analyzed to provide tools for the analysis of cumulative effects. Floodplain and channel resources (riparian and wetland vegetation, fish and wildlife habitat, spring creeks, grazing and hay land, etc.) will be inventoried in Phase II. Information from Phases I and II will be incorporated into a geographic information system (GIS) to facilitate subsequent analysis of cumulative effects. In Phase III, the potential cumulative effects of a variety of proposed and alternative channel modifications will be analyzed. Phases II and III will include multiple opportunities for public participation.

The investigation will start in the summer of 1999 and will require three years to complete. Phase I will be conducted by the Water Management Bureau (WMB) of the Department of Natural Resources and Conservation (DNRC) and the Montana District of the U.S. Geological Survey (USGS). Phases II and III will be done by Park Conservation District and DNRC, with assistance from other state agencies (DEQ and Department of Fish, Wildlife and Parks [DFWP]) and federal agencies (USGS, U.S. Army Corps of Engineers [Corps], U.S. Fish and Wildlife Service [USFWS], and EPA). Oversight of the project will be provided by the Governor's Upper Yellowstone River Task Force. The project will cost $639,880. Grant money requested from this program is $299,940. Matching funds amount to $243,440, and in-kind contributions are $96,500.

TECHNICAL ASSESSMENT:

The Governor's Executive Order (signed November 5, 1997) provides clear direction that a cooperative approach be developed to examine river channel problems and to formulate solutions that preserve the integrity of the Yellowstone River. The Upper Yellowstone River Task Force also created under this order has provided a public forum for regulatory agencies, landowners, recreational and agricultural water users,

and other interested persons, to discuss channel problems and confront the difficulties associated with implementation of river channel solutions.

Money spent on channel repairs will likely consist of a mixture of private and public money. To develop cost-effective and environmentally sound solutions to channel problems, it is important to understand the causative factors so that any money spent is strategically used. It is equally important to ensure channel work that is proposed at one location would not create new problems upstream or downstream. The proposed cumulative effects investigation will provide the basis for wise expenditure of both private and public money.

Currently, the upper Yellowstone River floodplain is ill defined. Floodplain development, in the absence of quantitative floodplain delineation, could have far-reaching effects on existing and future property owners and the river itself. Essential to wise land-use decisions is an accurately defined floodplain based on current topographic survey data. Because many of the Park County residents live within and adjacent to the floodplain, their health and welfare are directly linked to the quality of this information.

Under a no action alternative, the proposed cumulative effects study would not be performed. This could lead to two possibilities: 1) pending channel stabilization projects would proceed without a comprehensive basis for examination of their overall effect on channel stability and the cumulative effect on other channel and floodplain resources, or 2) a moratorium on pending applications for channel stabilization projects could develop, perhaps as the result of litigation. In the case of the former, significant construction of additional channel improvements without regard to their overall effect could create or exacerbate erosion and habitat loss problems in downstream reaches and result in the proliferation of channel problems and stabilization projects. In the case of the latter, continued pressure would be placed on permitting agencies to act without complete information.

Current uses of the river and its floodplain include wildlife habitat, agriculture, recreation, residential and commercial development, and infrastructure siting. Essential to any remedial effort, and the continued health of the river system, is the prioritization of future efforts.

Central to the proposed cumulative effects study is a collaborative public involvement process which, when combined with the results of the scientific and engineering investigations, will allow identification of the nature and extent of existing and potential problems and provide data and recommendations relevant to the long-term health of the system. An important part of this effort is development of specific information for the purposes of individual regulatory agencies (i.e., USFWS, USCOE, DFWP, DEQ, DNRC, etc.) Under no action, this user-oriented process, aimed at developing information and mutually beneficial solutions for the river and its users, would not occur.

Regulatory agencies, motivated by statutory requirements, may independently develop and implement cumulative effects investigations that are tailored to their specific obligations. The U.S. Army Corps of Engineers has requested funding for a study from Congress as part of its annual budget for the past several years and plans to do so for the coming federal fiscal year. The funding would be part of the Corps' annual operating budget, and any work done would be for that agency's regulatory purposes only and would need to be completed within federal fiscal year 1999 (ending September 30, 1999). The currently proposed scope of work assumes that the biological, chemical and physical inventory for the existing conditions has been completed (which is not the case). In addition, significant public and state agency involvement is not included, possibly because of the compressed time frame. Public and state agency involvement, which is critical to any proposed investigation, is emphasized in the RDGP request.

Another study proposed by the USFWS also has the potential of receiving congressional support and funding. This proposal would study the entire 670-mile length of the Yellowstone and take approximately five years to complete. A current price of $10 million is attached to the USFWS proposal.

Though not yet finalized in detail sufficient for comparative purposes, the Corps study could possibly address some of the same activities as this proposal. The same holds true for a 319 grant application submitted to Department of Environmental Quality by the applicant. If the 319 grant is approved, then the Phase I task called "Geomorphic Hydraulic Analysis" of the proposed RDGP study, which includes identification of historical channel changes/processes, may be duplicated. The applicant must work very closely with DEQ to eliminate any overlap between RDGP and 319. Phase II "Description of Channel and Floodplain Resources" and Phase III "Administrative Framework for Evaluation and Monitoring of Cumulative Effects" would be unaffected by the 319 grant proposal.

A benefit associated with the proposed project is the opportunity to build a defensible analysis of cumulative effects that will gain the confidence of diverse interests. Currently there are many questions concerning the fate of the Upper Yellowstone River and many opinions as to the causes and severity of problems. This investigation will provide the information and framework for answering these questions and for building public trust and confidence in the regulatory processes that control river channel modification.

FINANCIAL ASSESSMENT:

The following RDGP funds are requested:

Salaries and Benefits	$ 134,870
Contracted Services	$ 67,000
Supplies and Materials	$ 9,000
Communications	$ 1,750
Equipment	$ 46,500
Travel	$ 31,820
Rent and Utilities	$ 3,000
Miscellaneous	$ 6,000
TOTAL	$ 299,940

Project salaries and benefits are targeted for USGS personnel and Park Conservation District for surveying, modeling, mapping, analysis, and project administration over the three-year study period. This amount will be matched by $278,870 in agency salaries and benefits by USGS, Park Conservation District, the U.S. Natural Resources Conservation Service (NRCS), DFWP, USFWS, the Federal Emergency Management Agency (FEMA) and DNRC/WMB. Contracted services include the hiring of consultants for preparation of floodplain maps, photography and interpretation, sediment analysis, GIS setup and data entry and maintenance. Considering the expertise needed, person hours allocated over the three-year period, field time needed at the site, and the amount of match funds pledged as outside, non-RDGP contributions, the costs appear reasonable for the study designed.

The applicant is cautioned to pay close attention to the status of a proposed U.S. Corps of Engineer study that, if funded, will require coordination of manpower, activities, and budget by the applicant to prevent any overlap. As stated in the RDGP proposal, it will be the duty of the Upper Yellowstone River Task Force, which will oversee this project, and others, to formalize and coordinate the expectations, role, and commitment of all participants in the cumulative effects investigation. Obviously, the same holds true for

any other study or investigation that impacts the Yellowstone River segment being studied here.

ENVIRONMENTAL EVALUATION:

This investigation is not expected to generate any long-term adverse environmental impacts.

PUBLIC BENEFITS ASSESSMENT:

The investigation is designed to provide the information necessary to make informed decisions regarding solutions to river channel problems and overall management of the river and floodplain. A key aspect of the proposed project is a collaborative public involvement process, which will provide needed social and economic information about the people and communities that the river supports. This public input, combined with the results of the scientific investigation, will allow agencies and the affected public to make responsible decisions based on the behavior and characteristics of the overall river system and the needs of the community.

RECOMMENDATION:

A grant of up to $299,940 is recommended for this project contingent upon DNRC approval of the scope of work and budget. Prior to any release of RDGP funds for this project, the applicant must submit to DNRC a status report detailing the exact nature of other studies affecting the upper Yellowstone River, their cost, and their probable impact on the proposed RDGP-funded project. The report shall compare other studies with the RDGP study and include any modifications intended to avoid overlap of activities. The report must be approved and endorsed by the Upper Yellowstone River Task Force.

PROJECT NO. 8

APPLICANT NAME: TOOLE COUNTY

PROJECT/ACTIVITY NAME: Toole County Plug and Abandonment; Aid to Independent Small Oil Operators

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: 300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$ 11,465 Applicant

TOTAL PROJECT COST: $311,465

PROJECT ABSTRACT: (Prepared and submitted by applicant)

An unusually large number of stripper and/or subeconomic wells tend to exist in areas of older (1910 to 1940) production. Prior to reservoir economics, excessive numbers of wells were drilled to extract oil and gas from known fields. This drilling occurred prior to the establishment of the Board of Oil and Gas Conservation (BOGC) and the development of regulations concerning well and field spacing for the economic extraction of oil and gas. Presently, as the price of oil and gas fluctuates in relation to the

worldwide price, the economics of stripper wells in Toole County changes rapidly from profitable to unprofitable. Consequently, when the price of oil and gas is profitable, the small operator can make a living. When the economics swing, the operator is lucky to survive until the next profitable price swing occurs. Considering the current low price situation, this is the time to eliminate wells that have downhole problems and marginal profitability even when prices are good. Thus, eliminating these wells or helping to eliminate these wells will reduce the number of wells to a manageable level in order that operators are not burdened with an excessive number of unprofitable wells.

The purposes of the project are to:

1. Promote the plugging of subeconomic and problem wells
2. Promote the cost sharing of the plugging of subeconomic and problem wells
3. Involve the operator's knowledge and equipment to plug subeconomic and problem wells cost-effectively
4. Ultimately reduce the total number of problem oil and gas wells in Toole County
5. Reduce the amount of hydrogen sulfide, carbon dioxide, and hydrocarbon being vented to the atmosphere by idle oil and gas wells
6. Eliminate casing stubs and oil field junk from cultivated fields to reduce the hazards to agricultural equipment

The applicant is carrying out the project with assistance from the BOGC Shelby office.

The project area will encompass the entire County of Toole, but will probably be concentrated around the Kevin-Sunburst Field, where older, (i.e., 1920s-to-1940s-vintage) wells make up the majority of wells.

The project should take approximately two years to accomplish.

TECHNICAL ASSESSMENT:

Impetus for this proposal originates from the Board of Oil and Gas Conservation's recent rule requiring that "operators shall within one year after a well is no longer capable of production or determined infeasible for future recovery operations or disposal activities, plug and abandon the well unless otherwise authorized by the Board."

Strict enforcement of this rule, the applicant reasons, will force some small oil and gas operators out of business and into bankruptcy. As the result of this operator insolvency and inadequate bonding for the plugging and abandonment of these wells, the responsibility for proper plugging will ultimately fall upon the state. The applicant suggests further that a more gradual approach – one more financially manageable, and one that takes advantage of possible operator cost share now – may save the state money later. This assessment is probably correct, and the future cost of labor, materials, and equipment will be more expensive no matter who conducts the plugging. The unknown is whether holes plugged now, with RDGP funds, would have actually reverted to the state later. It is conceivable that some candidate operators may plug and abandon these holes without RDGP assistance. Eventually reclamation of many of the candidate wells may forfeit to the state at a much higher cost, than if operators help bear some of the costs now.

The established fact is that plugging these wells now with operator equipment and cost share is much cheaper and more timely than waiting and plugging later, using long, expensive, and complicated state bidding procedures and for-profit well plugging contractors. That appears to be reason in itself to recommend this project for funding.

If this grant is approved, the awarding of funds should contain a contingency that, once a well is plugged and abandoned using grant funds, it could never be reopened or redrilled unless the operator posts a bond sufficient to cover the cost of plugging specific to that individual site.

FINANCIAL ASSESSMENT:

The proposal requests the following RDGP funds.

Salaries and benefits	$ 6,176
Contracted services	$ 289,874
Travel	$ 1,200
Equipment	$ 2,000
Miscellaneous	$ 750
TOTAL	$ 300,000

The cost of plugging cannot be accurately evaluated without knowing hole specific conditions. The project will plug as many holes as possible with available funds. RDGP funds will be limited to a maximum of $20,000 for one operator. Amounts actually paid will be dependent on well depth according to the following formula:

- Less than 1000 feet deep = $.25/ft of plugged back depth
- Wells 1,000 feet to 3000 feet deep = $.50/ft of plugged back depth

Assuming plugging cost ranges between $1,000 to $1,500 per well this project could allow the plugging of 200 to 300 wells. .This would be a significant achievement at minimal cost to the state. State-conducted plugging could easily cost ten times this much.

ENVIRONMENTAL EVALUATION:

No long-term environmental impacts should be created in the plugging and abandonment of the proposed wells, provided reclamation activities are conducted properly. Short-term adverse impacts associated with the movement of equipment to the sites are expected. Compacted soil and destroyed vegetation on access routes will be reclaimed upon project completion, and any debris will be hauled off-site and disposed of in a licensed landfill. Short-term air pollution (e.g., dust, and emissions from combustion engines) would be minimal if equipment and traffic routes are watered as necessary and mechanized equipment is in proper working condition.

PUBLIC BENEFITS ASSESSMENT:

Improvement and protection of water, vegetation, and soil resources are the primary benefits of this project. If this project results in decreased numbers of problem wells being turned over to the State of Montana by small operators, then public dollars will be saved. These savings would benefit all Montanans.

RECOMMENDATION:

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

PROJECT NO. 9

APPLICANT NAME: BUTTE-SILVER BOW LOCAL GOVERNMENT

PROJECT/ACTIVITY NAME: Upper Clark Fork Basin: Superfund Technical Assistance

AMOUNT REQUESTED: $ 95,236 RECOMMENDED FUNDING: $95,236

OTHER FUNDING AMOUNTS AND SOURCES:

$137,605 Anaconda-Deer Lodge, Granite County, Powell County

TOTAL PROJECT COST: $232,841

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The principal purpose of this project is to sustain the efforts of Butte-Silver Bow, Anaconda-Deer Lodge, Powell and Granite Counties, and other local governments in the upper Clark Fork River basin to coordinate and manage Superfund activities. The project allows local governments and citizens (who possess limited financial and technical resources) to hire an individual with the independent analytical capabilities to evaluate scientific reports, remedial designs, and long-term plans. Information communicated to local leaders and citizens will enable them to participate effectively in the Superfund decision-making process.

The Superfund process in the upper Clark Fork River basin is ongoing and will by no means be complete by the year 2000. In fact, major decisions related to the remediation of many of the area's most serious environmental problems, such as the Streamside Tailings Operable Unit along with the Clark Fork River Operable Unit, will finally be under full consideration in the 2000-2001 time period. Consequently, the services and technical assistance that would be provided through this grant will continue to be vital.

The State of Montana's support and commitment to help these four counties, as demonstrated through this grant program, are critical. The counties are struggling to attain a meaningful role in the decision-making process. The upper Clark Fork River basin is a prime resource, and its eventual cleanup, reclamation, and/or mitigation of the mineral development impacts that occurred in the area over the past 118 years are a great challenge for all of Montana. Also, a Natural Resource Damage Claim litigation that is ongoing between the State of Montana and Atlantic Richfield Company will directly affect all of the upper Clark Fork River basin.

The cleanup of this river basin will have tremendous positive impact on the region within and surrounding the basin, and it is likely that the decisions made will set strong precedents for cleanup activities elsewhere in the state and nation.

TECHNICAL ASSESSMENT:

The main objective of the Superfund technical specialist is to provide policy, procedural, and technical analysis and evaluation. The overall objective for the local communities is to participate effectively in decisions concerning the assessment, management, and rehabilitation of the water and other resources of the basin. The specific project objectives proposed under this grant are as follows:

Objective #1 To review and provide comments on all site remediation work plans on behalf of the local governments and, based on general knowledge of the affected areas, to offer suggestions on effective implementation, especially with regard to long-term maintenance.

Objective #2 To evaluate technical assessments to determine the environmental problems related to contaminated soils and water, potential health risks, and preferred options for reclamation.

Objective #3 To investigate options and develop a long-term strategic plan to manage institutional controls on behalf of and in the best interests of the affected local governments. The strategic plan will identify long-term land uses for areas to be reclaimed and specify how reclamation work can be complete to sustain and, if possible, enhance such uses.

Objective #4 To support information dissemination efforts that enhance communication, facilitate discussion, and lead to effective decision making between and among potentially responsible parties (PRPs), regulatory agencies, and the general public.

Objective #5 To convene update sessions (as needed) in each county seat, providing opportunities for local officials and citizens to stay abreast of Superfund issues, particularly those that focus on long-term land use and institutional controls.

Objective #6 To provide technical and administrative support for implementation of federal grants secured by the four counties to re-use and redevelop reclaimed areas.

Although remedial work has been ongoing for several years in the upper Clark Fork River basin, an enormous amount of work remains in the following areas:

- Lower Area One/Colorado Tailings
- Montana Pole And Treating Plant
- Butte Priority Soils/Stormwater Runoff System
- Berkeley Pit Mine Flooding
- Streamside Tailings
- Old Works/East Anaconda Development Area/Golf Course
- Anaconda Regional Water and Waste Operable Unit
- Opportunity Ponds
- Flue Dust Repository
- Warm Springs Ponds
- Clark Fork River
- Developing of informational material to assist the public with Superfund issues
- Attending EPA/DEQ Superfund meetings and public meetings
- Advising elected officials (commissioners/chief executives)

The position has unquestionably been valuable in informing local leaders and county residents of the many and complex Superfund activities occurring in the basin. The legislature has acknowledged this need and funded three previous RDGP grants for this position in 1991, 1995, and 1997 (a total of $245,154). All four counties report satisfactory performance and continued need for this position.

If the need for this position continues after expiration of this grant (if approved) then the applicant needs

to pursue local resources for funding diligently. Full-time employees of the applicant are better supported using Butte-Silver Bow County funds rather than continued state funding.

FINANCIAL ASSESSMENT:

The application includes the following request for RDGP funds:

Salaries and wages	$ 62,400
Benefits	$ 21,336
Supplies and materials	$ 1,200
Communications	$ 1,800
Travel	$ 6,000
Miscellaneous	$ 2,500
TOTAL	$ 95,236

All salary and benefits figures are for the Technical Specialist position only. At $15 per hour this is reasonable and justified compensation considering the complexities of the job. Consultant prices to perform the same duties would likely run $50 to $100 per hour. County match of salaries and wages amounts to $95,715 in the form of in-kind services for both professional and supporting staff (planners, architects, surveyors, GIS specialists, clerical workers, etc.). Operating costs were derived from the previous Superfund Technical Assistance grant given to the applicant in 1997 and reflect current prices.

ENVIRONMENTAL EVALUATION:

Funding would be used to hire an individual for continued technical evaluation of Superfund activities in the Clark Fork basin. There are no environmental impacts associated with this action.

PUBLIC BENEFITS ASSESSMENT:

The public benefit of this project could be extremely valuable to the 54,000 citizens (according to the 1990 census) of the four affected counties. Damage to the resources of the area is extensive and complex, and solutions are often even more complex. The Superfund process demands active involvement in its decision making by those affected. The project will assist significantly in helping to inform local governments and their citizens about difficult technical issues affecting not only the governments of Butte-Silver Bow, Anaconda-Deer Lodge, Powell County, and Granite County, but also the region and the state.

RECOMMENDATION:

A grant of up to $95,236 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

PROJECT NO. 10

APPLICANT NAME: FERGUS COUNTY CONSERVATION DISTRICT

PROJECT/ACTIVITY NAME: Central Montana Artesian Basin Groundwater Project

AMOUNT REQUESTED: $283,113 RECOMMENDED FUNDING: $150,000

OTHER FUNDING AMOUNTS AND SOURCES:

$ 60,445	Montana Bureau of Mines and Geology
$ 35,000	U.S. Environmental Protection Agency
$ 48,031	Landowners
$ 4,000	Applicant

TOTAL PROJECT COST: $430,589

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The purpose of this study is to conserve high quality artesian groundwater resources by reducing surface flow from artesian wells. This study will characterize the hydrology of artesian wells and groundwater in central Montana. Historically, artesian wells in the area have high-pressure heads with resulting high rates of flow. The water pressure, and lack of equipment and technology, prevented many wells from being properly completed. Some artesian wells have been flowing continuously for as many as 70 years. Other wells have experienced so much pressure depletion that they now are pumped, further reducing aquifer pressure. Declining artesian pressure is widely reported by landowners in the study area. In effect, the groundwater has been "mined" by years of uncontrolled flow. The result is that artesian aquifers are being depleted faster than they can be recharged.

The goal of the Fergus County Conservation District as a project sponsor is to conduct specific well completion techniques to stop uncontrolled flow and measurably increase aquifer pressure. In its well information database (GWIC), the Montana Bureau of Mines and Geology has identified more than 3,000 wells drilled in Fergus and Judith Basin Counties since 1880. Many artesian wells will require rehabilitation so that well owners can control the rate and timing of water flow to coincide with water needs. Grant money will conserve valuable artesian water resources, improve the productivity of the aquifers, and restore reliable water supplies for future ranching, farming, and domestic needs.

The project area includes Fergus and Judith Basin Counties. Individual wells to be included and/or repaired will be determined by the project coordinator, working together with conservationists and well owners. Benefits of the project include conservation of valuable and extensive artesian water resources, education of well owners and water users on the benefits of conservation, and proven methods of well rehabilitation for application in areas experiencing similar problems. The project is designed to be completed in two years.

TECHNICAL ASSESSMENT:

The technical design could be better documented. A detailed discussion of results achieved in a similar study currently being conducted by the Petroleum County Conservation District would have been particularly helpful. Landowner cooperation and contractor availability, which were problems in that RDGP grant; are not addressed in this request. Researchers already have documented that although well control measures will conserve water at a particular well, achieving regional results is less certain and requires cooperation from a fairly contiguous block of landowners to be meaningful on the large scale proposed here. Additionally, the lessons and information gained from the Petroleum County Conservation District study should serve to educate landowners and others about the importance of water conservation without a new study.

The extensive mapping of regional aquifers this study proposes could probably be done on a smaller scale and still meet the project's goal of conserving water, which would result in more funds being available for plugging. The well rehabilitation methods and techniques proposed were sufficiently examined and proven to work in the Petroleum County Conservation District project and are readily implementable in this project.

While the application purports that many landowners are concerned about flowing artesian water wells, the proposal does not cite examples of what has been done about it. This raises questions regarding the priority of local landowners in controlling the flows, and whether one can expect the needed cost share participation from landowners. The proposal gives no hint of how many landowners will definitely participate or, at the scale proposed how objectives will be achieved and results measured. What happens if landowners do not participate? How many wells and landowners are needed to meet project objectives of large-scale mapping and sampling efforts? How will this information be used directly to conserve water?

The applicant outlines the following project objectives:

- Objective 1. – Locate and select wells
- Objective 2. – Conduct water conservation measures
- Objective 3. – Describe and map major aquifers
- Objective 4. – Monitor well plugging/rehabilitation
- Objective 5. – Describe aquifer characteristics, collect water samples
- Objective 6. – Educate water users about water conservation

Alternatives to these objectives were not discussed in the application, though there are potentially many. For each of the above objectives, RDGP offers the following comment.

Objective 1 – The well inventory can be accomplished through survey, subsequent sign-up of concerned participating landowners, and follow-up inspection by the applicant. No need is seen for an extensive inventory with maps, interpretation of geologic sources of aquifers, and exhaustive efforts to encourage landowners to participate. The applicant has received a 319 grant from the Montana Department of Environmental Quality to help conduct a well inventory ($110,000). Although this project has not yet started, it may be overlapped by the proposed study. Certainly much of this information directly relates to the proposed investigation and should have been discussed in the application for comparative review purposes.

Objective 2 – This is the heart of the proposal – install repairs, control flows, or plug the wells. RDGP proposes no changes, except that the study area and number of wells be supported by firm landowner commitments to cost share the plugging and rehabilitation costs with the applicant.

Objective 3 – A series of hydrologic and geologic maps for each aquifer in Central Montana is not needed to control or reduce artesian flows.

Objective 4 – Monitoring is needed to evaluate groundwater response to plugging or flow control. Though dependent on the location, depth, and number of wells plugged, it is doubtful that monitoring of potentiometric fluctuations in the major aquifers throughout Central Montana is needed. The scale of the project is too large and should be cut back until landowner participation has been confirmed and evaluated.

Objective 5 – This task does little to accomplish the major goal of conserving water and should be dropped or cut back substantially.

Objective 6 – Development of brochures informing and educating well owners on water conservation is being done on the Petroleum County Conservation District project. There is no need to duplicate that effort from scratch.

In summary, it is RDGP's feeling that the study tries to accomplish too much and needs to be scaled back significantly. Much existing information could be used to educate landowners on the importance of water conservation. As submitted, the proposed study concentrates too much on finding potential problems rather than on solving currently identified ones. This is not to say that the project lacks merit, but the project goals of conserving water can likely be done at considerably less cost.

FINANCIAL ASSESSMENT:

RDGP funds requested include:

Salaries and wages	$ 78,350
Fringe benefits	$ 8,763
Contracted services	$ 169,800
Supplies and materials	$ 1,200
Communications	$ 1,600
Travel	$ 15,000
Rent and utilities	$ 2,000
Equipment	$ 5,900
Miscellaneous	$ 500
TOTAL	$ 283,113

Over one half of the total costs are targeted for salaries and other personnel expenses. Given the nature of work and needed time commitment, this seems excessive. Justification for a full-time project coordinator on the two-year project is not well documented, particularly given the involvement of Montana Bureau of Mines and Geology staff and graduate students to advise and assist on the project. It is conceivable that the project will plug roughly 50 wells (given the applicant's estimates for plugging at $3,000 per well). Work on these wells should require no more than 2 to 4 days per hole for a total rehabilitation/plugging time of 200 days over the two-year period, leaving over two-thirds of the scheduled time for mapping and analysis. More time should be devoted to plugging and controlling known problem wells than to studying and mapping regional aquifers.

ENVIRONMENTAL EVALUATION:

The project is designed to mitigate damage to artesian aquifers. Long-term impacts to the aquifers can be expected if flows are not reduced or eliminated. Plugging and/or rehabilitation measures will require access to the sites by heavy equipment, and in some cases soil and vegetation resources will be destroyed, emissions will be generated from combustion engines and vehicular traffic, and the potential for oil and other fluids leaking on the ground surface will increase. These impacts are relatively minor and can be easily avoided and/or remedied through use of well-maintained equipment, dust suppression techniques, and site grading/restoration after project completion.

PUBLIC BENEFITS ASSESSMENT:

Benefits could be substantial to individual landowners participating in the project if artesian flows are reestablished and properly controlled. This may save them the expense of drilling new wells or pumping the existing wells. Educational benefits will be more widespread, potentially having impacts regionally and statewide.

RECOMMENDATIONS:

A grant of up to $150,000 is recommended for this project contingent on the applicant's providing signed commitments from the landowners to participate in the project to the extent of providing at least 35 percent of the total cost of assessing and repairing problem wells. An administrative charge of 10 percent of the contracted grant amount may be used by the Conservation District to oversee the project. The project must be redesigned to concentrate on repairs and plugging of problem wells already identified by landowner survey and 319 grant funds. Objectives 1, 3, 5, and 6 must be reduced in scope accordingly.

PROJECT NO. 11

APPLICANT NAME: Toole County

PROJECT/ACTIVITY NAME: North Toole County Reclamation Project

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $150,000

OTHER FUNDING AMOUNTS AND SOURCES:

$ 33,016 Applicant

TOTAL PROJECT COST: $333,016

PROJECT ABSTRACT: (Prepared and submitted by applicant)

Oil development and production in the north central Toole County Kevin-Sunburst field started in 1922. The field is located approximately 15 miles north of Shelby along Interstate 15 and surrounding Kevin on the Oilmont Highway. When regulation became effective in 1954, several thousand wells were already in place. The development area encompassed over 13,000 acres. Law did not yet regulate environmentally safe disposal of wastes such as waste oil and brine. Wastes such as these were commonly dumped on the land surface.

As oil production decreased, population also decreased, leaving behind many abandoned facilities. Many of these dilapidated structures and the remains of oil production equipment are still scattered over the land. Soil contaminated by past dumping of wastes remains unproductive. The condition of this oil field is a significant threat to public health, soil productivity, water quality, and economic opportunity in the area. Removal of structural debris and reclamation of impacted soils are needed.

The purpose of the North Toole County Reclamation Project, coordinated through the county health department, is to accomplish reclamation of this oil field by removing abandoned structures and debris

from impacted sites, assessing technologies for reclaiming oil-contaminated soils, and applying these technologies to a variety of sites. This is an ongoing project to accomplish the dismantling and removal of structures and associated oil field equipment, the reclamation and revegetation to productive range or croplands, and the development of a planning guide to facilitate future projects throughout Montana.

TECHNICAL ASSESSMENT:

This application is well documented, and the methods proposed for site reclamation and cleanup have been carried out at similar sites many times by the applicant in previous grants. In this proposal up to 29 sites will be reclaimed, the actual number depending on actual cost per site, funds available, and approval by the Board of Oil and Gas Conservation. Proposed reclamation activities include salvaging and replacement of topsoil; debris cleanup; removal of structures and equipment; excavation and backfill of pits, ditches, and improvements; excavation and disposal of oil-contaminated soils; disposal of oil sludge waste; regrading; and revegetation. The project will be bid competitively and awarded to the lowest qualified bidder.

Since 1985 the North Toole County Reclamation Project has been completed at 81 sites (at an average cost of $18,083 per site) representing a total of over 14,430 acres. To date, the total RDGP cost is $1,460,700. Results have been well received by area landowners and the oil and gas industry. Assessed values of property have increased from $23.16/acre in 1984 to $232.00/acre in 1993 (non-irrigated land) and from $3.72/acre in 1984 to $34.00/acre in 1993 for rangeland. The applicant states that these increases in property value can be attributed, in part, to reclamation efforts completed in previous grants. Project activities continue to be coordinated with EPA, DEQ, the Montana Salinity Control (MSCA), NRCS, BOGC, Montana State University (MSU) Extension, industry, residents, and landowners, thereby increasing the chances of project success.

This project, combined with plugging and abandonment work at orphaned oil and gas wells being conducted by BOGC, makes significant progress in the cleanup of the Kevin-Sunburst oil field.

FINANCIAL ASSESSMENT:

The applicant has requested RDGP funding for the following:

Contracted services	$	263,380	(for 29 wells)
Travel	$	3,620	
Miscellaneous supplies	$	3,000	
Contingency @ 10%	$	30,000	
TOTAL	$	300,000	

Costs are consistent with actual expenses on previous reclamation grants awarded to the applicant and are derived from bid tabulations and private engineering company fee schedules. The lowest qualified bidder will conduct reclamation. The grant request calculates 29 wells scheduled for cleanup and reclamation; however, only 11 appear to be at the stage where they can be competitively bid. A level of funding commensurate with 11 wells is recommended. If the applicant and BOGC later identify more seriously impacted sites, the 11 wells must be substituted with the more serious wells.

ENVIRONMENTAL EVALUATION:

Several short-term impacts would be likely to result from reclamation of these sites. Dust, noise, and soil,

and vegetative disruption could result from use of heavy equipment. Other impacts would ensue from disposal of oil sludge, burning of debris, excavation of burial pits, disposal of contaminated soils, and saline seep reclamation. Impacts from all of these activities could be kept to acceptable levels through use of best management practices, incorporation of approved reclamation methods in the bid plans and specifications, and continuing inspection by the applicant of cleanup progress. The expected impacts would be of short duration, provided the project is carefully designed and implemented. While complete prevention of impacts would not be possible, those that would result are expected to be moderate at worst. Considering the expected benefits of soil and water quality improvement, creation of wildlife habitat, and improved aesthetics over the long term, the environmental impact would be beneficial.

PUBLIC BENEFITS ASSESSMENT:

The project would reclaim acreage damaged by past oil and gas industry activities. The benefits to Montanans and the landowners include reduced health and safety hazards, improved quality of soil and water resources, enhanced economic opportunity on reclaimed lands, and increased land value.

RECOMMENDATIONS:

A grant of up to $150,000 is recommended for this project contingent upon DNRC approval of project scope of work and budget. It is further recommended that the applicant aggressively seek out financial commitment (cost share) from landowners towards cleanup of these old sites. Much of the benefit of cleaning up these sites accrues directly to them in the form of increased land values and acreage available for cultivation.

PROJECT NO. 12

APPLICANT NAME: MONTANA TECH OF THE UNIVERSITY OF MONTANA

PROJECT/ACTIVITY NAME: Champion International Gravel Pit Reclamation Project

AMOUNT REQUESTED: $88,230 RECOMMENDED FUNDING: $88,230

OTHER FUNDING AMOUNTS AND SOURCES:

$ 3,284	Applicant
$ 10,434	Farm Bill II
$ 36,450	Frontier West
$ 3,000	Bonner Development Group
$ 24,573	Farm Bill III
$ 3,000	Greil Family

TOTAL PROJECT COST: $168,971

PROJECT ABSTRACT: (Prepared and submitted by applicant)

This is a project to create economic development through the reclamation of an abandoned Champion International sand and gravel pit and subsequent blending into a recreational facility for the communities

of Bonner and Milltown. The project goal is to implement phases of reclamation outlined in the conceptual design of the Kim Williams North Shore Trailhead as presented to the Bonner Development Group (BDG) by Montana Tech of the University of Montana in March 1998.

The Bonner Development Group is the organization for which Montana Tech is carrying out the project. Over the past two years, BDG has developed plans and concepts that expand on recreational and educational opportunities associated with the Milltown Reservoir. In addition to the engineered trailhead concept, HDR Engineering completed a study in August 1997 that determined the feasibility of re-spanning the Clark Fork River with a multi-purpose bridge. The proposed bridge would link the communities of Bonner and Milltown to the extended Kim Williams trail. The north shore trailhead would provide access to the proposed bridge.

The sand and gravel pit is located approximately 7 miles east of Missoula and situated on the northeastern border of the Milltown Reservoir. The legal description is that portion of the S 1/2, SE 1/4, Section 21, Township 13 North, Range 18 West, M.P.M. lying southwest of Interstate 90 and northwest of the centerline of the Chicago, Milwaukee, St. Paul, and Pacific Railroad Company right-of-way in Missoula County, Montana.

The project will be completed by spring 2000.

TECHNICAL ASSESSMENT:

The technical design of this project is uncomplicated - purchase and spread approximately 4,340 cubic yards of topsoil over the 4.5-acre site to a depth of 6 inches. This will present no unusual difficulty for area contractors. All other work tasks and planning efforts except project oversight and travel/supplies will be implemented using non-RDGP funds.

Prior to topsoil placement, the pit area will be graded to 3:1 slopes where needed. Revegetation of the site will incorporate weed control measures. Coupled with successful implementation of other site planning efforts (e.g., landscape design, wildlife viewing area, interpretive signage, picnic shelters, and trail construction), this project will turn an unused liability (the pit) into a publicly supported recreation area.

FINANCIAL ASSESSMENT:

The requested RDGP funds include:

Salaries & wages	$ 5,650
Fringe benefits	$ 1,414
Contracted services (topsoil)	$80,216
Supplies and materials	$ 200
Travel	$ 750
TOTAL	$88,230

The cost of topsoil delivered and spread ($18.50/cubic yard) is reasonable and was obtained by informal bids through contacts with area contractors. Match funds from both private and federal sources are considerable and will be used for design ($10,434), fill material ($36,450), trail construction ($24,573), road construction ($3,000), and miscellaneous ($3,000). Indirect costs ($3,284) are being contributed by the applicant.

ENVIRONMENTAL EVALUATION:

Adverse impacts to human health or the environment are not expected to be long–term. Minor impact will occur as the result of heavy equipment (noise, dust particulate, emissions, gas/oil leakage), but can be easily mitigated through proper equipment maintenance and watering of the haul routes.

PUBLIC BENEFITS ASSESSMENT:

The ultimate goal of this project is to provide a stimulus for economic development and diversification, which in part will come from this project and its subsequent melding into a recreation area/North Shore Trailhead for the Kim Williams Trail.

The attraction of new business and development to the Bonner/Milltown area is the primary goal of this project. The recreational setting, wildlife viewing, and trail facility are attractive to new business and residential development. The project is a worthwhile endeavor and would compliment the "quality of life" amenities already in place in the Bonner/Milltown community.

Judging by the number of letters of support DNRC received concerning this project, the project has enormous public support.

RECOMMENDATIONS:

A grant of up to $88,230 is recommended for this project contingent upon DNRC approval of project scope of work and budget.

PROJECT NO. 13

APPLICANT NAME: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PROJECT/ACTIVITY NAME: Implementing Nonpoint Source Management and Total Maximum Daily Loads (TMDLs)

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $214,00

OTHER FUNDING AMOUNTS AND SOURCES:

$ 503,934	Applicant
$1,317,600	U.S. Environmental Protection Agency (EPA)
$1,006,600	U.S. Natural Resources Conservation Service (NRCS)

TOTAL PROJECT COST: $3,128,134

PROJECT ABSTRACT: (Prepared and submitted by applicant)

Despite Montana's bountiful water resources and national reputation for pristine trout streams, nonpoint

source (NPS) pollution is threatening water quality in hundreds of aquifers, streams, lakes, and rivers throughout the state. This proposal is to provide financial resources to protect groundwater and surface water statewide through the use of locally developed watershed projects. To carry out this strategy, additional funding is sought to implement key elements of watershed protection: developing and implementing total maximum daily load (TMDL) plans, targeting and coordinating best management practices (BMPs) on impaired watersheds (water bodies in need of TMDLs) with key groundwater and surface water pollution sources, applying required BMPs on a watershed scale, and providing multi-agency coordinated watershed assessments.

TMDLs are an important tool in the control of water pollution. Each river, stream, or lake has a safe or healthy level of water quality. Water quality standards, found in state law, define these levels. When these standards have been exceeded, the water body goes on the "303(d)" list of impaired waters needing a TMDL. State and federal laws require that TMDLs be done for all impaired waters, based on this 303(d) list.

Funds will be used to provide matching financial assistance to local groups that have indicated a desire to lead the restoration process through the conduct of assessment, planning, implementation, and monitoring activities.

Section 319 of the federal Clean Water Act of 1987 authorizes financial assistance to states to help them implement NPS pollution control programs. RDGP funds will serve as leverage for Section 319 matching funds and private contributions. Projects targeted for implementation include those involving:

1. Investigation and treatment of groundwater pollution
2. Nonpoint-source-related watershed projects that also serve as TMDLs
3. Planning and implementation of water quality plans on a watershed basis through a nonregulatory, locally led approach
4. Demonstration projects showing new BMP technology and specifically targeting animal waste/confinement sources of pollution
5. Unified watershed assessments that coordinate monitoring and evaluation of water quality data by various water resource agencies

The estimated time to complete this project is two years from the date that funds are received.

TECHNICAL ASSESSMENT:

The applicant asserts that earlier water quality programs have resulted in little nonpoint source pollution improvement in Montana. This is primarily due to the lack of available funding for project implementation. Over 25 percent of the state's streams are severely or moderately impacted, and approximately 75 percent of its lakes are impacted by nonpoint pollution. These figures indicate the serious nature of the NPS problem in Montana. All uses of Montana's waters – domestic drinking water, agriculture, recreation, industry, wildlife, and others are being adversely affected, creating economic hardship and human health hazards. Implementing land and water management practices that are prescribed in the State NPS Management Plan could mitigate the majority of the impacts. Action is necessary to implement these measures. Delays in project implementation will cause further deterioration of water quality and increased cost for future action. Priority waters are established in the State's 303(d) list of impaired waters. According to the applicant, EPA is presently being sued by five environmental groups for not holding the state to firmer schedules for TMDL approval. Recent TMDL state legislation requires that the state

systematically address this list of priority waters over a 10-year period. This project would meet a need to provide financial incentives for nonpoint source pollution control and development of TMDLs. Without a demonstrated commitment to restore water quality of all types, the State may be forced by current lawsuits to adopt unreasonable schedules and federally dictated compliance plans.

Adequate program funding for water quality projects is needed to provide cost-share incentives to landowners. BMPs technology would be demonstrated and associated educational programs developed to inform landowners and land managers of the applicability of various BMPs that work under Montana conditions.

Localized NPS control activities have been successful in the past, but on a statewide basis, total NPS pollution control is just beginning. It is important that the State NPS Management Plan be implemented more fully in the near future to address current NPS problems and to prevent the degradation of existing high quality water bodies. No action or delayed action could result in irreversible damage to the state's water resources and increase the threat to public health and safety.

The funds requested in this proposal are important to the success of the new TMDL program and the effectiveness of the NPS program in Montana. These funds will serve as leverage for federal 319 match funds and private contributions obtained by the Planning, Prevention and Assistance Division of DEQ.

By combining state and federal resources for assistance with local projects, the Planning, Prevention and Assistance Division will be in a proactive position to help Montana residents solve their NPS water quality problems.

The potential impact of this project is far-reaching. With increased emphasis on water quality improvement and protection nationwide, this program has the opportunity to place Montana in a proactive, leadership position to assist its citizens using a nonregulatory approach.

FINANCIAL ASSESSMENT:

RDGP costs are as follows.

Contracted services

Four groundwater projects at $25,000 each	$ 100,000
Three BMP implementation projects – (TMDLs) (at $40,000 each)	$ 120,000
Local sponsors at five sites for confined animal feeding operations	$ 25,000
Contracted printing cost of education materials	$ 5,000
Unified watershed assessments for use by local sponsors	$ 50,000
TOTAL	$ 300,000

Site selection is an ongoing process. In order to be selected, the site must be listed in the State's impaired water list (303 [d] reports). RDGP and combined matching funds will allow DEQ to fund approximately two-thirds of the projects currently submitted for funding. The above estimates are based on NPS projects carried out by DEQ since 1989.

Non RDGP match funds

Federal funds

Assessments and monitoring	$ 990,683
Staffing and administration	$ 327,517
Project funding	$1,006,600

DEQ (TMDL funds)

Contracts for local assistance	$ 120,000
Staffing and administration	$ 383,934

ENVIRONMENTAL EVALUATION:

The beneficial or adverse impacts that would occur are dependent on the specific individual projects funded through the nonpoint source program. If best management practices are applied, it is expected that there will be a direct reduction of soil erosion and improvement of water quality in the long term. Additional positive impacts would be realized through improved wildlife habitat, decreased water treatment costs, and improved land and water management. Positive environmental impacts from stream assessments will be more indirect.

Short-term water quality, noise, and dust problems could result during construction, e.g., installation of certain practices such as diversions and weirs. There is also the potential for impacts to historical/archeological resources if these are not surveyed before construction.

Permits may be required for some of the projects. Conservation district 310 permits would be required for replacement of diversion structures. Permit requirements will depend on the type of practice installed and its location.

PUBLIC BENEFITS ASSESSMENT:

Projects that implement best management practices under the program are expected to reduce erosion and sedimentation, minimize property damage, decrease susceptibility of adjacent lands to flooding, and reduce damage to irrigation structures and equipment. Public health, safety, and welfare would be improved, especially concerning drinking water supplies. Nonpoint source pollution control measures should reduce pathogens in surface water, decrease bio-accumulation of metals and pesticides in tissues of fish and other organisms consumed by humans, and lower the amount of nitrates that can cause infant health problems. Eutrophication of water bodies from excessive nutrient discharge would be reduced. The nonpoint source program will address environmental damage caused by mineral development such as toxic metals, acid mine drainage, and salts. Best management practices will restore and protect groundwater. Improved water quality is also important to Montana's growing tourism and recreation industries.

RECOMMENDATION:

A grant of up to $214,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

PROJECT NO. 14

APPLICANT NAME: UNIVERSITY OF MONTANA DEPARTMENT OF GEOLOGY

PROJECT/ACTIVITY NAME: Remediation of Groundwater at Abandoned Mine Sites: Application of Permeable Reactive Wall Technology

AMOUNT REQUESTED: $256,266 RECOMMENDED FUNDING: $198,866

OTHER FUNDING AMOUNTS AND SOURCES:

$100,458	Applicant
$ 10,000	University of Waterloo

TOTAL PROJECT COST: $366,724

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The goal of this project is to install a permeable reactive wall for treating metal-contaminated groundwater at an abandoned mine site in Montana. Our objectives include:

1. Selection of a site for remediation in cooperation with the DEQ, Mine Waste Cleanup Bureau and the U.S. Forest Service (USFS) within one month of the start of the project
2. Site investigation consisting of quantifying groundwater quantity, flow direction, and quality within the first three months of the start of the project
3. Batch and column testing of reactive mixtures and selection of the most optimal mixture within six months of the start of the project
4. Wall design and installation within the first year of the start of the project
5. Monitoring of groundwater and evaluation of effectiveness for at least one year after installation of the wall

We will collaborate with researchers at the University of Waterloo in Ontario, Canada, who have been at the forefront of reactive wall development and have secured five patents related to the application of reactive barrier technologies.

Permeable, geochemically reactive walls are a promising new approach for the treatment of groundwater contaminated by dissolved metals. There are completely passive remedial solutions designed to intercept and treat poor quality groundwater before it discharges and contaminates headwater streams and alluvial aquifers. Permeable reactive barriers are installed into aquifers by excavating aquifer material in the path of the migrating plume of contaminated groundwater and replacing this material with a reactive mixture. The reactive mixture is designed to promote the removal of contaminants as groundwater flows through the barrier. At abandoned mine sites in Montana, our goal is to intercept and treat poor quality groundwater before it reaches and contaminates surface springs or streams.

We anticipate that, once this work is accomplished for one site, the results can be extended at low cost to other locations in Montana.

TECHNICAL ASSESSMENT:

The primary goal of this project is to develop and test a new, innovative groundwater treatment technology that can be used to intercept and treat poor quality groundwater before it reaches and contaminates wells, springs, or streams. Treatment systems already exist that involve actively withdrawing contaminated groundwater and treating it above ground to remove metals or other pollutants; however, these systems are expensive to build, operate, and maintain. While used at active mining sites, these types of treatment systems are almost never feasible for abandoned or remote sites due to prohibitive logistics and continuing long-term costs.

Permeable reactive walls, as designed by the researchers at Waterloo, utilize reaction sequences and mechanisms to remove contaminants from the groundwater and result in stable, solid-phase sinks for contaminants. Reactions involving redox state control, alkalinity addition, sulfate reduction, and metal sulfide precipitation and co-precipitation have been used in reactive walls to promote formation of solid-phase products that are stable in the groundwater environment. The designers believe that in most cases it is not necessary to remove the reactive material from the installation; it should remain stable and unavailable to the groundwater system in perpetuity. The potential permanence of reactive walls could minimize long-term maintenance and disposal costs associated with many other types of groundwater treatment.

In order to design and construct a reactive wall, the applicant must first select a suitable site in western Montana. Following selection, the applicant must conduct a thorough hydrogeologic and water quality investigation of the site. Successful reactive wall treatment depends on a very detailed understanding of the background hydrologic and geochemical systems at the site. Along with the field investigations, a comprehensive program of laboratory testing of groundwater, soils, and various reaction media would be conducted at the University of Montana (UM). The testing and design of the reactive wall would be done in consultation with Waterloo researchers, who would visit the site and work with the applicant. Construction would require heavy equipment such as a track hoe, dump trucks and crane. An extensive water-quality-monitoring program is proposed to monitor the performance of the wall.

The applicants identified four alternatives to this approach:

- Conventional pump-and-treat system that the applicant regards as less effective due to the continual operation and maintenance costs
- Lime neutralization processes, which have the same operational and maintenance problems and sludge disposal issues
- Passive neutralization by lining channels with limestone or creating of an anoxic limestone drain, which are short-lived (failing when iron precipitates coat the lime media)
- Constructed wetlands, which, while successful to some extent, have reduced treatment efficiencies in freezing weather and high runoff conditions

Other potential alternatives suitable at some sites include:

- Removing or isolating the sources of contamination (waste rock, tailings, etc.) which is now the practice
- Controlling the recharge to mines by diversions and vegetative uptake
- Intercepting groundwater prior to contamination via directional drilling and drainage wells

- Flooding mines to limit oxygen and minimize the acid-producing geochemical reactions

The DEQ MWCB, USFS, and EPA in their ongoing remedial programs commonly perform source removal or isolation at costs of $200,000 to $1,000,000 per site. The other options have been tried sparingly in various pilot projects. The applicant's reactive wall has never been tried in Montana, to RDGP's knowledge.

The applicant's technical approach is desirable in the following respects.

- The technology treats contaminants in place.
- Two years of testing a full-scale reactive wall for metals treatment at the Falconbridge-Nickel Rim mine site in Ontario has demonstrated a two- to seven-fold reduction in dissolved iron, sulfate, and acidity.
- The technology was developed and has been published in leading journals by internationally recognized scientists.

The technical approach has some potential obstacles and difficulties, including, but not limited to:

- The effectiveness of the organic reactive material over time
- The effectiveness of arsenic treatment using organic material
- The life span of sulfate-reducing bacteria, and resultant effectiveness
- Wall permeability
- An ambitious schedule that is dependent upon uncontrollable factors such as timely cooperation from DEQ and USFS
- The need to find a suitable site in the absence of much existing subsurface data at candidate sites, and the relative dependence of project success on site suitability
- Uncertainty in project construction logistics and costs due to lack of experience, unknown site characteristics, and remoteness of sites
- Short (two-year) track records of performance history to date

Overall, RDGP believes the technical approach is well conceived and adequately supported in the application and suspects the technology will be useful as part of an overall groundwater treatment plan at specific sites. Whether the technology has widespread applicability at Montana mine sites is still unknown. The applicant has a proven track record of performance and collaboration in hydrogeology and geochemistry. UM has enlisted the active participation of the developers of the technology at Waterloo. There is however, other funding, and thus increased testing, of this technology being conducted by EPA and private companies, which the proposal does not address. One case in point involving comparable technology is the work being conducted at MSE Butte, Montana.

FINANCIAL ASSESSMENT:

The RGDP fund request for this project is:

Salaries and wages	$	77,115
Employee benefits		10,271
Contracted services		132,400
Supplies and materials		11,000
Communications		2,000

Travel	11,000
Miscellaneous	12,480
TOTAL	$ 256,266

In general, the salaries, benefits, supplies, communications, travel and miscellaneous costs are reasonable for the work proposed. The amount and types of applicant contributions and outside sources are substantial. Within contracted services, the budgeted construction cost of $38,000 could prove to be low. It is recommended that the applicant continue to pursue in-kind assistance from the USFS and identify contingent places in the proposed budget where additional construction costs could be covered.

There is also concern about funding salaries of the Waterloo researchers who have patented or will likely patent any innovations that this proposal will help demonstrate. This project is recommended for reduced funding in the amount of $198,866 with the condition that no RDGP funds be used for Waterloo researchers' salaries or fringe benefits.

ENVIRONMENTAL EVALUATION:

Any intrusive investigation and construction in mine-waste-contaminated areas has the potential to exacerbate environmental problems through spreading contaminants, creating hydrologic cross-connections, or improperly handling materials. The applicants must follow standard operating procedures for hazardous waste site operations, set by the Occupation Health and Safety Administration. All drilling and sampling equipment must be decontaminated between holes. All drill holes and monitoring wells must be properly completed and/or abandoned. Soil, water, and waste materials produced during the investigation may require special handling and disposal. These procedures should meet minimum requirements of DEQ and EPA.

PUBLIC BENEFITS ASSESSMENT:

This project will have localized public benefits related to water quality improvement in the drainage where it is implemented. More importantly, if the technology proves itself though long-term monitoring, it will have significant large-scale public benefits by providing a new technology that can be adopted at mine sites with contaminated groundwater.

Reactive wall treatment technology has been adapted to other groundwater contaminants such as chlorinated solvents and nitrate. Experience gained in this project could help enhance the transferability of the technology to other types of groundwater cleanup needs around the state.

RECOMMENDATIONS:

A grant of up to $198,866 is recommended for this project contingent upon DNRC approval of the project scope of work and budget. No RDGP funds can be used for Waterloo researchers' salaries or fringe benefits.

PROJECT NO. 15

APPLICANT NAME: BUTTE-SILVER BOW LOCAL GOVERNMENT

PROJECT/ACTIVITY NAME: Mining City Mineyard Preservation and Enhancement

AMOUNT REQUESTED: $297,104 RECOMMENDED FUNDING: 297,104

OTHER FUNDING AMOUNTS AND SOURCES:

$ 57,703 Applicant
$225,060 Aspen Youth Alternatives Program

TOTAL PROJECT COST: $579,867

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The historical headframes in the mining city have played an integral role in the history of Montana as well as the community of Butte. The headframes must be maintained, made safer, and in some cases restored as a prelude to future non-mining development uses, particularly as part of the creation of a Mining Heritage Park. The restoration is necessary as a reminder of Butte's history and as a focal point for the Butte National Historic Landmark District. These extremely significant, functional, architectural symbols cannot be allowed to fall into disrepair to the point where they must be removed for safety reasons.

In addition to the headframes themselves, the vegetated areas surrounding the headframes have in some cases been reclaimed and seeded with alfalfa and wild grass. In other cases, reclamation has consisted of lime rock cap or no remediation at all. These cases of minimal revegetation are not compatible with an urban setting and must also be addressed in this reclamation project and Heritage Park concept.

As part of the overall development of a Mining Heritage Park, 10 of the 14 headframes within this historical district will be maintained, made safer, and, in one pilot case, partially restored for future non-mining development. This activity will be accomplished through the joint efforts of the Montana Reclamation and Development Grants Program, the Butte-Silver Bow Government, the Aspen Youth Alternatives Program, the Apprenticeship Program of Iron Workers' Local #841, elements of the Montana University System, donated materials, volunteer time, and a community-based, nonprofit organization dedicated to telling the story of Old Butte.

The objectives of the grant project are to maintain and maximize the safety of our headframes, to restore working functions to one headframe, to establish an education-based training program to preserve the actual resource, and labor resource, and to provide an opportunity for possible use of shaft water to support mineyard revegetation.

Butte-Silver Bow is the organization responsible for the execution of this project, located in the Urban Corridor of Butte-Silver Bow. The schedule for completion of the project will be 18 months, if inclusive of two summer construction seasons.

TECHNICAL ASSESSMENT:

The project is adequately documented and technically feasible. A major focus of the proposal centers on preservation of historical resources (headframes) that are deteriorating due to time and the elements. The applicant asserts that repair and maintenance of these structures will (1) eliminate health and safety

hazards associated with the sites, (2) invigorate the local economy, and (3) preserve these historical resources for future generations.

First, regarding health and safety objectives, do other alternatives exist that would prevent or reduce the likelihood of persons frequenting these areas or climbing on these structures - restricted entry, for example? Even when fully restored, these structures will have associated safety and liability issues. This is not to imply that safety concerns are any less real – only that they are probably not the primary driving force behind the proposed effort. Safety concerns, for the time being, can be addressed by appropriate institutional controls. Not dissimilar are health concerns created by exposure to asbestos. RDGP would agree that some degree of risk is associated with this hazard; however, other options are available to the applicant to minimize these risks. RDGP thus does not place major priority on use of RDGP funds to mitigate the threats to human health and the environment presented by this material. The applicant has also stated that asbestos removal will be funded using non-RDGP funding.

The second and third major thrusts of the application, those dealing with the economy and historical preservation, are thoroughly discussed in the application. These components of the applicant's overall master plan for community historical restoration, rate lower in priority than mine cleanup, but are worthwhile expenditures if RDGP funds are available.

FINANCIAL ASSESSMENT:

The RDGP budget is comprised of the following.

Contracted Services	$	247,104
Supplies & Materials	$	50,000
TOTAL	$	297,104

Based on actual costs of similar Butte area historical preservation efforts, the costs seem reasonable for the work to be performed.

ENVIRONMENTAL EVALUATION:

Long-term adverse impacts to the environment are not expected. Activity typically associated with construction sites (e.g., noise, dust, traffic, fluid spills, and fuel leakage) will be short-term and present no major concern. Asbestos removal (conducted by the applicant using non-RDGP funds) will require appropriate protection and safeguards to prevent exposure to workers.

PUBLIC BENEFITS ASSESSMENT:

The importance of these historical mineyards has been recognized in their role as an essential component in the Mining Heritage Park envisioned in the applicant's Regional Historical Preservation Plan. The State of Montana has also acknowledged the community importance by recognizing the Anaconda-Butte Corridor as a State Heritage Area. Montanans will derive benefit from this project, directly, and indirectly. Butte residents, Montanans, and tourists will have an opportunity to explore the cultural and historical resources and benefit from the enhanced aesthetic improvements. For the surrounding neighborhood, the headframes often provide residents with a focal point for identification. In addition, the Heritage Park will provide a central connection between Glacier and Yellowstone National Parks, drawing in tourists traveling between these two parks. The aesthetic improvement in the area could attract more businesses. The restoration will provide jobs and job training. Some positions will be permanent because of the increased

maintenance requirements of the Butte-Silver Bow Parks and Recreation Department.

RECOMMENDATION:

A grant of up to $297,104 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

PROJECT NO. 16

APPLICANT NAME: MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

PROJECT/ACTIVITY NAME: Wetland Inventory for Montana

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $300,000

OTHER FUNDING AMOUNTS AND SOURCES:

$ 2,400	Applicant
$210,000	U.S. Fish and Wildlife Service
$120,000	U.S. Army Corps of Engineers
$ 20,000	Montana Department of Fish, Wildlife and Parks

TOTAL PROJECT COST: $652,400

PROJECT ABSTRACT: (Prepared and submitted by applicant)

Montana lacks a baseline inventory of its wetland resources and is one of only two states for which the National Wetlands Inventory (NWI) is largely incomplete. Montana's wetlands are valuable because they help protect water quality, provide critical wildlife habitat, prevent erosion and flooding, and serve as groundwater recharge and discharge sites. In preparing the *Montana Wetland Conservation Strategy Situation Assessment and Recommendations* report (1998) (Mueller, G. 1998), interviewed 48 diverse individuals and organizations in Montana about wetland issues and recommended that Montana complete a wetland inventory. According to the report, interviewees disagreed about the status of Montana wetlands, and they stated that the disagreement over whether Montana is losing or gaining wetlands and the quality of those wetlands is likely to exist until a credible inventory is completed.

This grant would provide matching funds to produce 400 draft, final, and digital National Wetland Inventory maps for Montana. NWI maps are standard (1:24,000 scale) topographic maps that include the location and classification of all photo-interpretable wetlands. The maps are for resource inventory purposes only and do not have any relationship to wetland regulatory programs. The classification of wetland types is done according to national standard mapping conventions, making the products compatible across geopolitical boundaries. Wetland maps are the most frequently requested source of wetland data in the country. They are used for a variety of purposes including helping to determine eligibility for some Farm Bill programs, identifying areas for potential restoration and enhancement, aiding in design planning for development projects, and tracking wetland gains and losses.

Eighty-eight percent of the lower U.S. has been mapped; due to the lack of matching funds, most of Montana has not. The National Wetland Inventory has invested approximately $3,000,000 in Montana toward map production. In addition, nine other agencies or entities have invested approximately $320,000 toward wetland mapping in Montana for their areas of interest.

This project would provide state funds to leverage additional money from other sources that require a state match to help complete the wetland inventory for Montana. DEQ would not conduct the mapping, but would provide the leadership and coordination to NWI to ensure that this project is completed within a two-year time frame.

TECHNICAL ASSESSMENT:

The application states that DEQ has been designated by the Governor and by the U.S. Environmental Protection Agency (EPA) as having the lead on wetland conservation activities in the state. DEQ is also responsible for providing leadership direction and staff to the Montana Wetland Protection Grant Program. The U.S. Fish and Wildlife Service is responsible for mapping and inventorying of wetlands throughout the U.S. Approximately 88 percent of the lower U.S. has been mapped in digitized fashion.

In this proposal DEQ requests funding for the production of 400 draft (1:24,000 scale) and 400 final maps (1:24,000 scale) by the U.S. Fish and Wildlife Service. An additional contract would be executed with the U.S. Army Corps of Engineers to digitize the 400 maps. These proposed maps would result in about 50 percent coverage for the state of Montana, compared to the current 20 percent coverage. Whether additional funds will be secured, allowing 100 percent coverage is unknown at this time.

Technically, the proposal appears sound and will be managed by competent professionals at both the state and federal levels. Less clear are the need and urgency for these maps, and the impact of no funding from RDGP – two primary factors used in the ranking of RDGP grant applications. It is difficult to whole-heartedly endorse the proposal absent substantial funding commitment by the applicant. Similarly, the Department of Fish Wildlife and Parks (DFWP), Department of Transportation (DOT), Bureau of Land Management (BLM), and U.S. Forest Service (USFS) have failed to make a significant monetary contribution to the project. It appears that the proposal does not rank high in terms of agency priorities at this time. Without such commitments, the project does not compete well with other RDGP applications submitted and rates low in meeting RDGP goals and objectives relative to need and urgency.

FINANCIAL ASSESSMENT:

The applicant is requesting the following use of RDGP grant funds.

Contracted services

U.S. Fish and Wildlife Services (draft and final maps)	$170,000
U.S. Army Corps of Engineers (digitized maps)	$130,000
TOTAL	$300,000

Grant funds will be used to leverage additional funds from other state and federal agencies totaling $350,000. To date, NWI has contributed $3 million to Montana for map production with an additional

$320,000 being contributed by the National Park Service, U.S. Bureau of Indian Affairs, Ducks Unlimited, Montana DFWP, and U.S. Fish and Wildlife Service. Federal cutbacks have accelerated the search for matching non-federal funding. Without state funding, the Wetland Inventory for Montana may not progress much further. The probable outcome is one that provides federal dollars now available for cost share to riparian mapping in other states that are contributing match funds. No RDGP funding may mean that roughly only 20 percent of Montana will be mapped, versus 50 percent if funds are approved.

ENVIRONMENTAL EVALUATION:

This mapping project will have no adverse environmental impacts.

PUBLIC BENEFITS ASSESSMENT:

As citizens began to recognize the value of wetlands and the need for wetland information, the federal government responded with the Emergency Wetland Resources Act of 1986. It directs mapping of the lower U.S. to be completed by 1998 and a digital wetland database to be produced by 2004. However, due to a 50 percent budget cut at the national level, these dates will not be met. Eighty-eight percent of the lower U.S. is complete, however, Montana remains one of only two states that are largely unmapped.

According to the applicant, wetland maps are the most frequently requested source of wetland data in the country. Wetland maps are used for planning for watershed and drinking water supply protection, siting of transportation corridors and expansion projects, construction of solid waste facilities, and siting of schools and other municipal buildings. NWI maps are used by agriculture to help identify wetland areas in determining Farm Bill program eligibility for Montana farmers and ranchers. NWI maps aid in design planning for development projects. DOT is hampered in its ability to design roadways to avoid or mitigate impacts to wetlands. Sportsmen use NWI maps to locate likely bird hunting on public lands. Conservation districts use NWI maps to implement the Natural Streambed and Land Preservation Act (310). Natural resource planners use wetland maps for many purposes including developing comprehensive resource management plans, natural resource inventories, and habitat surveys; analyze trends in wetland status such as tracking wetland gains and losses; and identifying areas for potential restoration and enhancement. Real estate companies, bankers, and city governments needing zoning will gain from knowledge of known wetlands.

RECOMMENDATION:

A grant of up to $300,000 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

PROJECT NO. 17

APPLICANT NAME: FLATHEAD COUNTY BOARD OF COUNTY COMMISSIONERS

PROJECT/ACTIVITY NAME: Assessment of Aggregate Resources in Flathead and Missoula Counties

AMOUNT REQUESTED: $166,553 RECOMMENDED FUNDING: $166,553

OTHER FUNDING AMOUNTS AND SOURCES:

$ 21,374	Applicant
$ 64,384	Montana Bureau of Mines and Geology

TOTAL PROJECT COST: $252,311

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The Flathead Regional Development Office (FRDO) and the Missoula County Office of Planning and Grants (MOPG) in cooperation with the Montana Bureau of Mines and Geology (MBMG) propose a study of aggregate resources (crushed stone, sand, and gravel) in Flathead and Missoula Counties. Aggregate is the most widely used non-fuel mineral resource in the United States and is used in all types of construction. The demand for aggregate has increased substantially in Flathead and Missoula Counties because of rapid population growth. Mining of aggregate raises environmental, engineering, and economic concerns, and often leads to conflicts between aggregate producers and citizens. Long-range planning can reduce these disputes arising over conflicting land uses.

The goal of this project is to reduce conflicts between citizens and aggregate producers by providing information on potential aggregate resources in a format useful for long-range planning and resource management. Objectives include development of mapped data in digital and drafted form. These maps will include information on the location of potential aggregate resources, aggregate quality, aggregate quantity, depth to groundwater, groundwater quality, groundwater flow direction, and land use. A final report will be published by MBMG. The digital data will be managed and updated by resource planners, and any party interested in aggregate resources can use the final report. FRDO will administer the project, provide oversight, and provide technical information. Technical information and oversight will also be supplied by MOPG. Field work, compilation of data, development of maps, and preparation of the final report will be provided by MBMG. MBMG will coordinate with the Montana Department of Transportation to obtain existing information and share data. The project will be completed within two years of the starting date.

TECHNICAL ASSESSMENT:

This inventory of aggregate resources will compile existing information on the locations of sand and gravel deposits, identify and then prepare maps of potential new deposits, compile and interpret hydrologic data for the Missoula Valley, evaluate new and currently available information regarding bedrock geology, and publish a Montana Bureau of Mines and Geology publication on the investigation results. Use of this information by local government bodies, the application asserts, will reduce conflicts between landowners, private citizens, and aggregate producers.

There appears to be some validity to the notion that increased data on possible impacts to the human and physical environment caused by mining operations at a specific location lead to more informed decision making by regulatory bodies charged with the siting and permitting of gravel pit operations. Significantly less clear, however, is the conclusion that a direct connection exists between more informed decision making by regulators, or between more informed citizens and gravel operators, and reduction in conflicts.

Inherently, mining activities are often quite contentious, regardless of the amount of information available and whether it is readily accessible. Also a concern is that, even if local government could promote harmony between citizens, landowners, and aggregate producers by this mapping effort and testing of

aggregate quality, private industry, being a chief benefactor of the project, is probably a more appropriate source of funding, than RDGP.

The vast majority of the work proposed involves data collection, drilling, sampling, analytical testing, and map preparation by the Montana Bureau of Mines and Geology, which, no doubt, will do a quality job. Assuming, however, that this information will reduce or prevent conflicts is a giant leap. Problem identification is lacking– most importantly, the exact nature of these conflicts, their intensity, and what is currently being done to resolve them. Other alternatives to the proposed project were not discussed in the application. This is seen as a major omission. To suggest that the presented proposal is the only remedy to conflicts is not realistic. It may be part of an overall solution, but the application does not present sufficient information on who will use this information and in what situations, how the proposed actions reduce conflict, or why other available options for handling conflicts are unacceptable. Setup and implementation of a GIS system, a major objective of the project, does not necessarily guarantee the results envisioned by the applicant. Specific detailed discussion is needed of how and when the information generated will be formulated into long-range planning efforts and under what circumstances conflict resolution is expected.

Another alternative, which involves permitting and siting of gravel pit operations by the Department of Environmental Quality, was not adequately discussed in the application. Information generated in this project may assist regulators in their required environmental review of proposed aggregate operations, but the application does little to support the application premise that this information will definitely result in regulatory changes or planning at the local level, resulting in conflict resolution. In the sense that the information generated will be more readily available, the application has usefulness, but it rates low in meeting RDGP program objectives. The urgency of this request needs better documentation.

FINANCIAL ASSESSMENT:

The proposal requests RDGP funds for the following.

Salaries and wages	$ 64,039
Benefits	$ 20,474
Contracted services	$ 61,700
Supplies and materials	$ 550
Communications	$ 500
Rent and Utilities	$ 950
Travel	$ 12,940
Equipment	$ 400
Miscellaneous	$ 5,000
TOTAL	$ 166,553

The budget seems excessive to gather existing data on aggregate resources. All salaries and benefits, contracted services, equipment, (total $146,613), and nearly all of travel, supplies and materials, and communication expenses are devoted to the Montana Bureau of Mines and Geology to conduct the investigation. Flathead County requests $5,000 for administration of the project under the miscellaneous category. Specifics of exactly how information translates directly to conflict resolution is notably absent from the proposal.

Whether project objectives are cost-effective is uncertain from the application. For example, task 3, "Compilation and Interpretation of Hydrologic Data", is scheduled for approximately 26 months. Other than

collecting information on water levels, there is little mention of the type of data that will be collected and what specific purpose it will be used for. Can the MGMG Groundwater Assessment Program fund all or a portion? Is the project a hydrological investigation or an aggregate resource inventory? In case of the former, this information is useful in other contexts e.g. septic systems and private water supplies.

ENVIRONMENTAL EVALUATION:

The majority of the mapping and data compilation work will have no direct impact on the environment. Field crews and associated heavy equipment will have a short-term impact on traffic patterns and may contribute to noise and air pollution. Disruption of soils and vegetation from vehicular traffic will also be likely. Long-term impacts to the environment are not expected from this study.

PUBLIC BENEFITS ASSESSMENT:

Many conflicts between involved parties are settled by those parties. In this case, the proposal states that conflicts are between the aggregate producers, citizens, and landowners. Meetings, mediators, zoning regulations, and the courts are other mechanisms that are probably more cost-effective than this proposal. An express need for the information this study would generate is not sufficiently convincing for a wholehearted endorsement by RDGP, given that much of the information already exists in both the private and governmental sectors.

RECOMMENDATION:

A grant of up to $166, 553 is recommended for this project contingent upon DNRC approval of the project scope of work and budget.

THE FOLLOWING PROJECTS ARE NOT RECOMMENDED FOR FUNDING. THE LIST IS ALPHABETIZED BY THE NAME OF THE APPLICANT.

For projects that are not recommended for funding, "TOTAL PROJECT COST" is the sum of the "AMOUNT REQUESTED" and the "OTHER FUNDING AMOUNTS AND SOURCES."

APPLICANT NAME: JEFFERSON COUNTY

PROJECT/ACTIVITY NAME: Water Quality and Quantity Management Improvement Project for Jefferson County

AMOUNT REQUESTED: $300,000 RECOMMENDED FUNDING: $0

OTHER FUNDING AMOUNTS AND SOURCES:

None

TOTAL PROJECT COST: $300,000

PROJECT ABSTRACT: (Prepared and submitted by applicant)

Water management, and the disposal and stabilization of mining wastes have been a burden to the mining industry for centuries. The abundance of waste rock dumps and soluble toxic heavy metals tailings is an environmental and management problem. Montana contains nearly 12,000 abandoned mine and mineral properties and military reservations, mainly located on federal and state land. The state has studied many of these properties and has identified the feasibility of metals extraction, water control, and reclamation.

Typically, hard rock wastes consist of minerals chemically bound in oxides or sulfides that ultimately come in contact with water. After metallurgical processing, most oxide wastes are normally inert, offering little opportunity to recover trace metals or extract an efficient energy source. Conversely, sulfide ores are much more difficult to process because of the chemical capability to produce acidic compounds, e. g., acid rock drainage. In Jefferson County, water from the streams and adits should be directed from passing over the tailings and contaminating our water systems.

At most hard rock mine sites, strategic and base metals were overlooked or were not the target metal at the turn of the century. As a result of acidic conditions generated from sulfides in mining wastes, toxicity levels are increased in local streams. The state has reviewed current technologies in the literature and environmental projects, but it does not have the resources to address the water discharged from the abandoned mines that are currently polluting our streams in Jefferson County. It is our goal to start at the headwaters of one of the major pollution problems and work our way down the drainage. Jefferson County had 14 of the top 20 abandoned mines, and the amount of water contaminated is unknown at this time. Our objectives are to: (1) identify and locate the contaminants entering the waterways, (2) construct diversion channels around the most serious problems, where water is passing over tailings, and (3) seriously review the technologies to extract metals from the many abandoned mine sites.

Jefferson County, with assistance from our consultants, can develop a diversion project to reduce or eliminate a significant acid mine drainage problem. The project is intended to lead to many abandoned mine drainage cleanup projects, creating a new resource recovery industry and eliminating pollution. By carefully controlling the water, Jefferson County, in conjunction with Environmental Technologies International (ETI), would construct the necessary diversion and channel to eliminate runoff from encroaching onto tailings. The multistage process combines water management and state reclamation standards to accomplish the tasks.

A pilot project is proposed to be constructed near the abandoned Bluebird Mine, located west of Jefferson City, Montana. The duration of the pilot project is two years, with the project expected to be continued and/or expanded thereafter.

The grant request is for $300,000 to establish the pilot project for a duration of 24 months. A quality control/quality assurance program would ensure that diversion facilities transferring unwanted water around the tailings are effective. Other sites nearby would also be evaluated.

TECHNICAL ASSESSMENT:

Jefferson County is proposing to conduct this project with the technical assistance of Environmental Technologies International (ETI), a consulting company with an office in Helena. The applicant believes that significant mine-waste-related water contamination can be eliminated by relatively simple diversions of water around waste rock dumps and mine tailings. In some future project, it hopes to be able to demonstrate that metals can be economically recovered from the mine wastes, creating a resource

recovery industry.

This study has the following tasks:

- Initiate a pilot project near the abandoned Bluebird Mine, where sulfide-laden waste dumps can be purchased

- Construct water diversion channels and small drop structures to route water from the mine adit around the tailings to the main channel below.

Some monitoring and evaluation of the effectiveness of the project would be performed, including open-channel flow and water quality monitoring, under a state-approved plan. Certain reclamation standards would be followed, and a detailed quality control/quality assurance plan would be developed following funding

The applicant identified the alternative to this approach as the method it believes the State of Montana relies upon heavily, that is, the removal and burial of mine wastes outside the drainage. The applicant characterizes this approach as wasteful, costly, and often not solving the long-term environmental problem.

The applicant's technical approach is desirable in the following respects

- It appears to be simple, relying on basic engineering and construction practices
- At the right site, it could lead to water quality improvements at relatively low cost
- It purportedly could lead to resource recovery from mining wastes, to be accomplished outside project's scope

The technical approach presented in the application is deficient in a number of aspects, including:

- A total lack of background information regarding the water and mine waste characteristics of the proposed site, impeding judgment on the efficacy of the proposed project
- No demonstration that the approach is suited for this site or could be effective in achieving the stated goals
- No submittal of a design concept or analogous project design
- No discussion of coordination with the Department of Environmental Quality's Mine Waste Cleanup Bureau (DEQ/MWCB) or State Superfund Program

Although not included with the original application, a site location map and several photographs of the site were submitted in response to questions during the review process.

DEQ/MWCB has a serious difference of opinion regarding the need for and potential effectiveness of the applicant's proposed project. DEQ cited water quality monitoring data from points above and below the waste rock dump indicating that the water discharging from the mine adit is already contaminated with metals. After flowing through the mine waste, all metals except chromium were lower in concentration (report to DEQ by Pioneer Technical Services, 1995).

The applicant maintains that its work would involve diverting both the mine drainage and the creek upstream of the mine wastes. The creek water is reportedly not contaminated prior to flowing through the tailings. The applicant contends that it plans to address larger water quality issues than planned by DEQ.

This lack of basic agreement between the applicant and DEQ/MWCB on the technical merits of the proposal is a serious matter that the application does not address and is beyond the scope of this review to clarify.

Theoretically, diversion of good quality water around reactive mining wastes should lead to water quality improvements. The applicant may be fully informed and capable of carrying out the work, and the site may be suitable; however, insufficient supporting documentation was provided to demonstrate this clearly. This deficiency, coupled with the lack of documented coordination with other technical specialists in DEQ and the Superfund program who have regulatory oversight responsibility, do not permit a favorable technical assessment of the project at this site for the current application cycle.

FINANCIAL ASSESSMENT:

The RDGP fund requests for this project are:

Salaries and wages (consultant)	$ 72,800
Employee benefits (consultant)	21,840
Contracted services (construction)	170,000
Travel	5,000
Rent and utilities	10,000
Equipment	7,000
Miscellaneous	13,360
TOTAL	$300,000

A budget detail form or narrative explaining how cost estimates was derived was not included with the application. A required match contribution from the applicant was not identified. Project expense categories were not connected with specific project tasks. The lack of a tentative design plan or detailed costs prevents RDGP from making an informed assessment of the proposed project costs. Since this is a relatively straightforward engineering design and construction project, the applicant could readily develop a preliminary design for the site, break the project into logical components, and project estimates of labor expenses for each phase of the project.

ENVIRONMENTAL EVALUATION:

A construction project in or around extensive mine waste deposits has the potential to cause additional adverse impacts to the environment. This application lacked sufficient documentation of site-specific plans to perform a credible environmental evaluation. The application notes that construction procedures must meet minimum reclamation standards. The application should discuss whether any contaminated soil, water, or waste materials would be disturbed or produced during the work and indicate use of proper handling and disposal procedures or guidelines.

PUBLIC BENEFITS ASSESSMENT:

The major question related to public benefits is connected with the uncertainty of the project's technical merit, as previously discussed. A well documented and properly implemented project could have substantial public benefits for Jefferson County. However, it is not possible to assess the public benefits adequately from the information submitted in the pending application.

RECOMMENDATION:

Although the type of project proposed in this application could be beneficial in the right situation, this application is not recommended for any level of RDGP funding at this time due to the factors discussed above. The applicant is encouraged to re-assess its objectives and plans, coordinate its proposal with DEQ/MWCB, and consider submitting a better-documented application in the next cycle.

APPLICANT NAME: CITY OF LEWISTOWN

PROJECT/ACTIVITY NAME: Source Location of Hazardous Organic Contaminants, Big Spring Creek Drainage

AMOUNT REQUESTED: $290,610 RECOMMENDED FUNDING: $0

OTHER FUNDING AMOUNTS AND SOURCES:

$ 4,000	Applicant
$105,120	Montana Bureau of Mines and Geology
$ 3,000	U.S. Natural Resources Conservation Service (NRCS)

TOTAL PROJECT COST: $402,730

PROJECT ABSTRACT: (Prepared and submitted by applicant)

The proposed research will delineate the source of organic contaminants that have been detected in both fish tissues and sediment samples taken from the Big Spring Creek drainage in and around Lewistown. Results from sediment analyses have conclusively determined that this section of the Big Spring Creek drainage has been the site of a release of the industrial chemicals known as polychlorinated biphenyls (PCBs). Other industrially-related chemicals known as polynuclear aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPHs) have also been detected within this area and will be addressed as secondary issues. Of significance is the confirmed fact that PCBs persist in this drainage and have accumulated in fish tissues to the point that a health advisory was issued in 1995 by the Montana Department of Public Health and Human Services (DPHHS). How the contaminants have come to be tied up in these sediments and fish tissues is a main concern of this investigation.

The principal project goal is to determine the location of the contaminant sources by backtracking and evaluating two possible mechanisms for contaminant movement, namely, erosional transport and groundwater migration. With regard to the first mechanism, erosional transport, the possibility will be investigated that the accumulation of organic contaminants, specifically PCBs in the stream sediments, is the result of contaminated road-building materials eroding into the stream. The practice of applying thin coats of oil to rural dirt and gravel road surfaces as a dust suppressant has been identified as the probable cause for similar contamination problems. In the past, the oils used for such applications were commonly recycled oils of industrial origins and were prone to contamination through the practice of combining waste oils from various processes prior to disposal or reuse. It is possible that such a waste oil product, contaminated with PCBs, could have been applied on local roads, adsorbed to soil particles, and since eroded into the nearby stream.

The second mechanism of contaminant movement, groundwater migration, is equally likely because the floodplain adjacent to the contaminated stream channel has been the location of numerous industrial activities during the past 70 years. As a result of these activities and the additional use of this area as a local dump, the potential exists for a surface release of these contaminants and their migration to the shallow groundwater table and ultimately to the stream channel. In addition, depending on groundwater flow gradients and bedrock lithology, a potential exists for contaminants to infiltrate into regional bedrock aquifers.

If the sources of these materials can be located, then remediation activities can be initiated to minimize future environmental impacts. The investigation will be administered by a committee appointed by the Lewistown City Council and conducted by investigators from the Montana Bureau of Mines and Geology. Although the project is site-specific, it has the potential to become regional if the organic contaminants are carried farther downstream in the Big Spring Creek drainage. The project site is located at the southeastern edge of Lewistown in a 1.5-square-mile area commonly called the Brewery Flats. The legal description for this site is Section 23 Township 15 North, Range 18 East. Completion of the project will take two years.

TECHNICAL ASSESSMENT:

The project is presently ineligible for RDGP funding. Section 90-2-1112, MCA states in part, that:

> *A proposed project is ineligible for reclamation and development grants funding if there is a liable party who would be relieved of financial or legal responsibility and who can reasonably be expected to be held responsible.*

In cases where contaminated sites contain hazardous substances (in this case PCBs) the appropriate agencies making this determination are the U.S. Environmental Protection Agency (EPA) and the Montana Department of Environmental Quality (DEQ). In checking with both agencies, neither agency has yet identified the existence of a viable potentially responsible party (PRP). Investigations, however, are in progress.

In some situations EPA and DEQ may request RDGP funding from DNRC to assist in PRP identification or contaminated site cleanup. Again, neither agency has done so during the current grant cycle. EPA and DEQ may also take in financial and technical partners, such as the applicant and MBMG, to assist in site remediation planning and cleanup efforts. Towards this end, it is recommended that the applicant contact and closely plan and coordinate the proposed study with EPA and DEQ and resubmit the revised application during the next RDGP funding cycle, commencing May 15, 2000. Absent EPA and DEQ approval and participation in the proposed effort, RDGP funding is not recommended for the current request.

FINANCIAL ASSESSMENT:

The RDGP fund requests for this project are:

Salaries and wages (MBMG)	$117,920
Employee benefits (MBMG)	41,146
Contracted services	75,400
Supplies and materials	10,400
Communications	2,500

Travel	22,580
Rent and utilities	2,064
Equipment	10,500
Miscellaneous	8,100
TOTAL	$290,610

In general, most budgeted rates are reasonable given the extensiveness of the work proposed. Of the total budget, approximately $6,000 would be expended by the city for supplies, travel, communications, and administration. The remaining funds are budgeted for MBMG. However, the scope of work in some areas is broader than needed to accomplish project objectives. The personnel time was not allocated to specific project tasks, making the assessment difficult. Some observations and suggestions for the project budget follow.

A research chemist and laboratory technician was budgeted at eight months per year and an associate hydrogeologist at 5 months per year, for a two-year project period. Although the chemist and laboratory technician are budgeted individually, laboratory analytical services are also included in addition to analyzing the project samples. However, there is not adequate rationale in the proposal or subsequent discussions to justify the full level of support requested here.

For the work described, the drilling services budget may be about $5,000 higher than market rates. Laboratory rates are competitive, except that the chemist and laboratory technician were budgeted in addition. The use of field test kits for organic contaminant screening should be evaluated as a means to minimize analytical costs. A consulting organic geochemist was budgeted at $5,000; however, no discussion of the role and scope of this person were described in the proposal. All other costs appeared reasonable for the design proposed.

With a more focused scope of services, and coordination with DEQ, EPA, and DFWP the project objectives could likely be accomplished at considerably less cost.

ENVIRONMENTAL EVALUATION:

The Big Spring Creek area is a hydrologically sensitive area and the source and extent of contaminants are still unknown. Any intrusive investigation in such an area has the potential to exacerbate environmental problems though spreading contaminants, creating hydrologic cross-connections or handling materials improperly. The applicant must adhere to the training requirements and standard operating procedures for hazardous waste site operations, according to the Occupation Health and Safety Administration. All drilling and sampling equipment must be decontaminated between holes. All drill holes and monitoring wells must be properly completed and/or abandoned. Soil, water and waste materials produced during the investigation may require special handling and disposal. These procedures should meet minimum requirements of DEQ and EPA.

PUBLIC BENEFITS ASSESSMENT:

This proposal addresses primarily a local problem, but one with statewide significance. For most Montanans, Big Spring and Big Spring Creek represent the essence of water purity. Lewistown, Montana, represents the West the way it was. Local visitors and tourists expect the quality of Big Spring Creek to be among the best in the state and nation. On this basis, the project has significant, large-scale public benefits.

The project is very significant to the City of Lewistown from the standpoint of future economic development and quality of life. The project area is the cornerstone of a potential recreational complex envisioned by city leaders.
The applicant and investigators must remain sensitive to the regulatory and enforcement aspects of this site. If new information provides sufficient justification to pursue a responsible party, the broader public interest indicates that this project be redirected appropriately. Ongoing coordination with DEQ is a must.

RECOMMENDATION:

This project is not recommended for funding for the reasons stated above. Dependent upon the results of ongoing regulatory investigations, RDGP funds may be appropriate in the future.

CHAPTER III

STATUS REPORT OF 1991-1997 PROJECTS

This chapter briefly summarizes the status (as of October 1, 1998) of active projects and those projects that have been completed since preparation of the January 1997 legislative report. The projects are grouped according to the year in which they received legislative approval; within each such grouping, the projects are presented in the order of their relative funding priority.

Projects Approved by the 1997 Legislature

1. Montana Board of Oil and Gas Conservation/Balco Disposal Facility, Plug and Abandonment and Site Restoration

This project located in Richland County has been competitively bid and awarded to a Billings' area contractor. Construction work consisting of draining the disposal pit, water disposal, collection and transfer of pit waste oil to on-site disposal tanks, removal of oil sludges and disposal in a lined disposal pit, and removal and disposal of the old pit liner has been completed. The grantee is currently evaluating informal bids for the removal, transport and disposal of approximately 16,000 barrels of waste oil, made difficult by the current unmarketability of this material. Other work to be completed will include back filling of the pit with clean fill material and site revegetation. The total costs of cleanup may exceed the grant award of $600,000, in which case the grantee may need to use unused funds remaining from its Devil's Basin plugging and abandonment priority grant approved by the legislature in 1995.

2. Montana Department of Natural Resources and Conservation/Reliance Refinery Soils and Sludge Cleanup

The purpose of this project is to remove, treat, and recycle approximately 20,000 cubic yards of oil-contaminated soils. The site is located on school trust land near Kalispell, Montana. The applicant continues to conduct site motoring of contamination levels and mobility, and analysis of test burn emission results. These data will be used for preparation of documents specifying human and ecological risk-based cleanup goals and ultimately project bid specifications and design plans. The project is being coordinated with the Montana Department of Environmental Quality's State Superfund Program. Cleanup and construction are expected to be completed on schedule. A total of $582,300 was awarded by the legislature for this project (two grants).

3. Montana Department of Natural Resources and Conservation/Reliance Refinery Soils and Sludge Cleanup

Please see #2 above.

4. Department of Environmental Quality/Nancy Lee Mine Complex Reclamation

As of October 1998, Nelcon, Inc., the construction contractor for the site, has completed 96 percent of the reclamation work at the Nancy Lee Project. The following have been completed.

1. Stormwater and erosion control
2. Access road improvement and dust control

3. Clearing and grubbing of trees and shrubs
4. Construction of a six acre repository
5. Excavation of 125,000 cubic yards of tailings from Slowey Mill area
6. Excavation of 10,000 cubic yards of tailings from Mill Gulch area
7. Grading and application of 2,083 cubic yards of soil to waste rock
8. Reconstruction of 6,000 feet of Mill Gulch drainage
9. Seeding, fertilizing and mulching seven acres
10. Constructing 2,400 feet of fences
11. Reclaiming roads, and
12. Debris disposal

By December 1998, 14 additional acres will be seeded and another 2,000 feet of fence will be constructed, and the project will be completed.

The Reclamation and Development Grant for the Nancy Lee Project is in the amount of $84,640.00, for the reclamation of 4,000 cubic yards of tailings that have been placed in the constructed repository. The total cost of the construction to this point has been $933,537. Match funds were provided by the grantee.

5. Department of Environmental Quality/Nellie Grant Mine Reclamation Project

As of October 1998, Smith Contracting, Inc. has completed approximately 90 percent of the reclamation work specified for the Nellie Grant mine site. The following work is completed.

1. Access road improvement and dust control
2. Timber clearing and grubbing
3. Removal and on-site recycling of steel and disposal of hazardous waste at a licensed facility
4. Repository construction, lining, and loading with approximately 18,000 cubic yards of tailings
5. Leachate collection system construction
6. Disturbed area grading
7. Stream and sediment pond construction
8. Topsoil borrow area construction and removal of approximately 20,000 cubic yards of topsoil
9. Lime and organic amendment of site soils
10. Fence installation

6. Powell County/Charter Oak Mine and Mill Reclamation Project

The Charter Oak Mine and Mill are located approximately 25 miles southwest of Helena in the Little Blackfoot River drainage. The project has been completed and was designed to remove and contain contaminated waste rock in an engineered repository. Eventual use of the site will involve recreation and establishment of a historical interpretive center.

7. Mile High Conservation District/Highland Mill Reclamation

This project is designed to remove and dispose of contaminated mill tailings into an engineered repository and reestablish the natural drainage of Moose Creek. The site is located approximately 11 miles south of Butte, Montana. The total reclamation cost for the entire site is $496,000, $258,070 of which is being paid by RDGP. The project has been delayed due to non-availability of matching funds. The grantee is currently reevaluating the design and seeking increased funding commitment from several sources.

8. Butte Silver Bow Local Government/Upper Clark Fork River Basin: Superfund Technical Assistance

The purpose of this project is to sustain the efforts of Butte-Silver Bow, Anaconda-Deer Lodge, Powell, and Granite Counties to coordinate and manage Superfund activities in the Upper Clark Fork River Basin. The project allowed these local governments and citizens (who possess limited financial and technical resources) to hire an individual with the independent analytical capabilities to evaluate scientific reports, remedial designs, and long-term plans. In the grant period, the technical specialist (TS) worked on several projects.

For Butte-Silver Bow and Anaconda-Deer Lodge, the TS worked on the Streamside Tailings Remedial Design and provided valuable comments to EPA and DEQ. The TS also reviewed and commented on the Preliminary Final Design Report for Reach A of Sub-Area One of the Streamside Tailings Operable Unit. The Technical Specialist ensured that the design met the interests of the counties in terms of long-term operation and maintenance concerns, and the end land use of the remedy as a "greenway" corridor. The TS prepared meeting notes for the technical meetings; distributed those to the agencies, ARCO, and other interested parties; and organized public information meetings to explain the remedial design process and report on the progress of the design.

The technical specialist also represented Butte-Silver Bow at all meetings and activities regarding the Montana Pole and Lower Area One Superfund sites. The TS monitored construction progress, reported on all pertinent issues that affected the county at each site, represented Butte-Silver Bow at all Citizens Technical Advisory Committee meetings, and answered questions related to Superfund sites in the Butte area.

For Powell County, the technical specialist reviewed several Superfund documents dealing with the Clark Fork River and the remedial investigation associated with that Superfund site. For Granite County, the technical specialist helped keep local officials apprised of the status of the Clark Fork River project, as well.

By providing assistance and analyses of plans and studies, the Technical Specialist helped enable local leaders and citizens in the four-county area to participate more effectively in the Superfund decision-making process.

9. Montana Board of Oil and Gas Conservation/1996 "A" Orphaned Well Plug and Abandonment and Site Restoration

The grantee is currently preparing bid plans and specifications for bid solicitation. Well plugging and abandonment are planned for areas located in Richland and Yellowstone counties.

10. Carbon County/Dry Hydrant Demonstration Project

This project is under contract and is expected to be completed by January 2000. The purpose of this project is to effectively demonstrate the use of dry fire hydrants as a means to improve fire protection for Montana residents.

11. Toole County/North Toole County Reclamation Project

Started with RDGP funding in 1985 and located in the Kevin-Sunburst Oil field, near Shelby, this project

continues to clean up surface impacts created by abandoned oil and gas activities. Combined 1995 and 1997 RDGP grant funds were used to reclaim six sites in 1998. As of October 1, 1998, approximately $159,000 in grant funds has not yet been disbursed to the grantee. These funds will be used in spring, 1999.

12. Butte-Silver Bow Local Government/Butte Mine Subsidence Reclamation

The purpose of this project is to remediate abandoned mine openings and subsidence problems in Butte in the most effective and cost-efficient manner. Other objectives of the project are to identify and hold accountable responsible parties on applicable sites, to investigate the liability issues associated with these hazards, and to develop a response process that prevents the local government from increasing or assuming responsibility for the hazard by responding to the problem.

Through the first two fiscal quarters of the grant project, four subsidences have been remediated directly by the project sponsor, and the use of the grant as an incentive for responsible parties to mitigate hazards on their own (to prevent having liens placed on their properties) has resulted in the remediation of several others. Tasks to be undertaken during the winter months will concentrate on liability investigations, development of a computer database, and public education.

13. Rosebud Conservation District/Hydrologic and Geologic Feasibility of Coal Mine Pits as Water Impoundments

This project is under contract and is expected to be completed by March 2000. The purpose of this project is to encourage coal mine reclamation techniques that provide beneficial surface-water resources for post-mining land users through the use of final mine-pit impoundments, where appropriate. This broad purpose is further divided into two specific purposes: (1) to develop a thorough understanding of existing mine-pit impoundments in southeastern Montana, and (2) to develop new methods and identify existing techniques that can be used in current and future mine reclamation to determine in advance the feasibility of final-pit impoundments.

14. Deer Lodge Valley Conservation District/Development of Acid/Heavy Metal Tolerant Cultivars

The purpose of this project is to develop plant cultivars that will grow on acidic and/or heavy-metal-contaminated sites. Work now centers on field plot evaluations, evaluation data entry, and data processing. Performance assessments of plant material include height, vigor, rate of spread, seedbed production, and percentage of each replicate. Field plots are in various stages of seed increase and quite labor-intensive. Future collections of seed selected for increase will be grown in the Plant Materials Center in Bridger and subsequently transplanted to seed increase plots in the spring of 1999. A number of greenhouse collections are currently in seed increase.

Projects Approved by the 1995 Legislature

1. Montana Board of Oil and Gas Conservation/Devils Basin: Plug, Abandonment and Restoration

This project involves plugging and abandonment of 18 wells in Musselshell (14), Richland (2), and Roosevelt (2) Counties. All locations are plugged and restored. Final inspection will take place during the

1999 spring/summer growing season.

2. Montana Board of Oil and Gas Conservation/South Cut Bank Field – "A" Plug, Abandonment, and Restoration

This project plugged and abandoned 17 wells in Glacier County. All work has been completed.

3. Montana Board of Oil and Gas Conservation/South Cut Bank Field – "B" Plug, Abandonment, and Restoration

This project plugged and abandoned 21 wells in Glacier County. All work has been completed.

4. Montana Department of Natural Resources and Conservation, Trust Land Management Division/Oil Well Abandonment

This project plugged seven wells located on school trust lands in Glacier County. The grant was administered by the Board of Oil and Gas Conservation (BOGC) in conjunction with other BOGC projects being conducted in the immediate vicinity. Final inspection of vegetative growth will be conducted in spring of 1999. (The Department of State Lands was awarded this project; in July 1995, that department became part of the new Department of Natural Resources and Conservation).

5. Lewis and Clark County, City of Helena/Tenmile Mine Site Reclamation Project

This project was designed and let for bid using non-RDGP funds. Non-cooperation of the site landowner, however, prevented this project from being constructed. None of the $75,000 in RDGP construction funds allocated for this project has been expended, and the grant was terminated in October 1998.

6. Montana State University/Clean Tailings Reclamation

The project is under contract and is expected to be completed by December 31, 1999. This project will test a new mineral mine reclamation technique that separates sulfide mineral contaminants from mine tailing material. This new method uses a field-deployable mineral separation technology. Sulfide mineral contaminants are contributors to acid mine drainage.

7. Cascade County Conservation District/Muddy Creek Water Quality Improvement

The project, which was completed in July 1998, funded the implementation of best management practices and installation of sediment reduction structures in a reach of Muddy Creek near Vaughn, Montana.

8. Montana Department of Environmental Quality/Nonpoint Pollution Control

This project is under contract and is expected to be completed by May 31, 2000. This project funds several of Montana's voluntary nonpoint source pollution control projects. Funds are used for watershed project implementation, water body assessment, training, educational materials, and technical assistance.

9. Butte-Silver Bow Local Government/Upper Clark Fork Basin: Superfund Technical Assistance

The purpose of the project was to sustain the efforts of Butte-Silver Bow, Anaconda-Deer Lodge, Powell,

and Granite Counties to coordinate and manage Superfund activities in the Upper Clark Fork River Basin. The project allowed these local governments and citizens to hire an individual with the independent analytical capabilities to evaluate scientific reports, remedial designs, and long-term plans. In the grant period, the technical specialist (TS) worked on several projects.

For Butte-Silver Bow and Anaconda-Deer Lodge, the position worked on the Streamside Tailings Remedial Design and provided valuable comments to EPA and DEQ. The TS also reviewed and commented on the *Preliminary Final Design Report for Reach A of Sub-Area One of the Streamside Tailings Operable Unit*. The technical specialist ensured that the design met the interests of the counties in terms of (a) long-term operation and maintenance concerns, and (b) the end land use of the remedy as a "greenway" corridor. The TS prepared meeting notes for the technical meetings; distributed those to the agencies, ARCO, and other interested parties; and organized public information meetings to explain the remedial design process and report on the progress of the design.

The technical specialist also represented Butte-Silver Bow at all meetings and activities regarding the Montana Pole and Lower Area One Superfund sites, monitored construction progress, reported on all pertinent issues that affected the county at each site, represented Butte-Silver Bow at all Citizens Technical Advisory Committee meetings, and answered questions related to Superfund sites in the Butte area.

In Powell County, the technical specialist reviewed several Superfund documents dealing with the Clark Fork River and the remedial investigation associated with that Superfund site. For Granite County, the technical specialist helped keep local officials apprised of the status of the Clark Fork River project, as well.

By providing assistance and analyses about the plans and studies, the technical specialist helped enable local leaders and citizens in the four-county area to participate more effectively in the Superfund decision-making process.

10. Montana State University Extension Service/Pollution Prevention Program

This project was completed in August 1998. This project's goal was to work with small businesses in Montana to reduce the amount of waste, such as packaging waste, waste oil, and dry cleaning fluid, that is being generated. This was done through a proactive education outreach program.

11. Glacier County Conservation District/Water Quality Demonstration and Reclamation, Red River Drainage

The purpose of this project is to conduct cleanup of oil and gas sites, saline seep areas, and agricultural feedlot operations that affect the water quality of the Red River drainage system. The project was amended in October 1998 to delete cleanup of feedlot operations because of unavailability of suitable sites and landowner cooperation. The funds originally targeted for feedlot cleanups are being used for oil-and-gas-site restoration.

12. Toole County/North Toole County Reclamation Project

Please refer to project status of Toole County Reclamation Project found under "Projects Approved by the 1997 Legislature" (page 67).

13. **Montana Department of Natural Resources and Conservation/Scobey Reclamation Site**

This project was completed in August 1997. This project reclaimed an abandoned gravel pit and wash site near Scobey, Montana. (The Department of State Lands was awarded this project; in July 1995, that department became part of the new Department of Natural Resources and Conservation.)

14. Petroleum County Conservation District/Petroleum County Artesian Basin Groundwater Project

This project is scheduled to be finished by January 31, 1999. The project has worked under an agreement between the Montana Bureau of Mines and Geology and Petroleum County Conservation District. The purpose of this project was to conserve water by reducing the number of uncontrolled flowing wells in the county. This was accomplished by repairing wells that were fixable, plugging wells that were too costly to repair, and completing wells as to prevent damage by freezing conditions. Project success was measured by the volume of water saved and more directly in places by monitoring increases in aquifer pressure.

Landowners initially indicated work was required on about 64 wells in Petroleum County. These wells were inspected by the project hydrogeologist, and a repair plan was developed. Since the initial inspection, all but 20 wells were programmed for further work. The landowners voluntarily requested any additional work and developed an agreement with the district. Landowners agreed to pay 23 percent of the repair costs, with the grant paying the remaining 77 percent. By the end of September 1998, a total of 27 projects were completed or close to completion. The types of projects included plugging wells, installing liners in wells, redrilling wells, and winterizing wells. The average total cost per well was about $2,940. Grant funds have paid for about $61,000 of the repairs, and the district anticipates spending another $38,000 to repair the remaining programmed wells.

Preliminary results from repairs of Eagle Aquifer wells near the confluence of Box Elder Creek and Brush Creek are encouraging. The existing repairs at three wells have conserved approximately 112 gallons per minute that had been flowing continuously for many years. Aquifer pressures increased several feet in nearby parts of the aquifer. Water savings totals 161,280 gallons per day, 4,838,400 gallons per month, and 21,321,000 gallons per year from this small area. Water can now be put to beneficial use only when required, conserving both water and the artesian pressure that permits water use in remote areas.

Projects Approved by the 1993 Legislature

1. Montana Board of Oil and Gas Conservation/Cat Creek Plugging and Abandonment Project

The three oil and gas wells in Petroleum County originally slated for plugging under this grant have been completed. Due to cost savings on these wells, an additional five wells will be plugged. The grantee is in the process of preparing bid plans and specifications for these five additional wells (October 1998).

2. Montana Department of Fish, Wildlife and Parks/Elk Creek Placer-Mined Channel Reconstruction

The project has been completed. The Department of Fish, Wildlife and Parks reconstructed approximately 3,000 feet of the Elk Creek stream channel near Garnet, Montana. Historical placer mining had destroyed the original channel and eliminated surface flow along three stream reaches. The stream channel was reestablished and riparian areas restored to enhance the stream fishery. The site is a demonstration area

on how to implement best management practices on streams damaged by placer mine operations. Monitoring of the project will continue through January 2001.

3. Town of Columbus and Town of Joliet/Waste Stream Reduction-Oil Recycling

The project was completed in July 1998. The purpose of this project was to establish a pilot waste-oil collection center in six Montana communities. Centers are located in Big Timber, Boyd, Glasgow, Glendive, Park City, and Sidney, and each community has signed a three-year waste-oil collection agreement with a private waste-oil processing company. Informational dissemination regarding the benefits of the project, including newspaper coverage, brochures, pamphlets, and periodic newsletters, has been impressive.

4. Carbon Conservation District/RC&Ds Affecting Change through Local Leadership

This project was completed in July 1997. This project funded the seven Resource Conservation and Development Areas around the state to complete regional rural development plans. This project also included conducting workshops and initiating 35 specific projects. All of the seven regional RC&Ds completed their plans. The Montana State Association of RC&Ds used these funds to complete a statewide economic development plan based on the regional plans.

5. Montana Department of Environmental Quality/Nonpoint Source Pollution Control in Montana

This project is underway and scheduled to be completed in June 1999. This project funds several of Montana's voluntary nonpoint source pollution control projects. Funds are being used for watershed project implementation, water body assessment, educational materials, and technical assistance.

6. Montana Bureau of Mines and Geology/Acid Mine Drainage Prevention, Control, and Treatment Technology Development for the Stockett/Sand Coulee Area

This project was completed in June 1998. During November 1997 the grantee finished all field work at the project site and abandoned and reclaimed the portal site and most monitoring wells. The landowner agreed to allow the grantee to leave some monitoring wells in place in anticipation of future work. In conjunction with DEQ, the grantee hopes to pursue funding from the federal Department of Energy and the state Abandoned Mined Land Program to apply the results of this project to the Stockett site. The existing monitoring wells will prove to be extremely valuable.

The final report is intended to be released as a Montana Bureau of Mines and Geology open file report. It has been written and is in review with release scheduled prior to January 1, 1999.

7. Deer Lodge Valley Conservation District/Developing Acid/Heavy Metal-Tolerant Cultivars for Mine Reclamation

This project was completed in February 1998. The goal of this project was to identify and select plant materials that are tolerant to sites characterized by either acidic conditions or high concentrations of heavy metals. This process began with seed or plant collection; progressed through initial evaluation, seed increase, and advanced field testing; and culminated with the plant selection being released to commercial seed growers.

The following tasks have been completed.

Review of literature
Identification of contaminated collection sites
Seed and plant collection for testing
Establishment of three field-testing sites
Initial evaluation of test sites
Testing of asexual propagation techniques on several woody plant species
Testing on seed dormancy and germination
Placement of three species in initial seed increase

Follow-up tasks needing to be completed in connection with this project include seed increase, advanced (large-scale) field-testing, and release to commercial seed growers. A 1997 RDGP grant was approved for these activities in the amount of $100,000.

Projects Approved by the 1991 Legislature

1. Chinook Irrigation District/Milk River Water Supply Project Rehabilitation and Betterment Element (Canals and Laterals)

A $300,000 grant was authorized by the legislature in 1991. A grant agreement was executed in June 1993. A total of $71,310 has been disbursed for the project. The Chinook Division is using the funds to repair aging infrastructure and improve irrigation efficiencies through canal lining, the installation of headgates, and other irrigation infrastructure improvements. The 172 farms within the Chinook District comprise just over 38,000 irrigated acres of the 92,000-acre Milk River Irrigation Project. The project will be completed in November 1998.

2. Montana Salinity Control Association (MSCA)/Soil and Water Nonpoint Source Pollution Control and Management

The project was completed in July 1997. MSCA operates a program of technical field assistance designed to correct saline seep and reclaim land on a farm-by-farm basis. Recharge area identification, hydrologic investigation, and soil and water quality sampling and monitoring are used to develop reclamation plans; intensive cropping methods are emphasized.

3. Carbon, Chouteau, Custer, Dawson, and Lake Counties Pesticide Contamination Cleanup

This project is scheduled to be completed in October 1998. This project involves the investigation of pesticide-contaminated sites in, or adjacent to, three rural airports and two weed control districts. The five sites investigated were the Joliet weed control district; the Miles City, Richey, and Geraldine airports, and the Lake County weed district. Site investigation, feasibility/treat ability studies, and risk assessment have been completed for all five sites.

The results of the assessments indicated that the level of dioxin found at the Joliet site warrants the highest priority for cleanup of the five sites. The high risks associated with this site limit the remediation choices and drive up the costs. The Joliet site will require all of the funds originally allocated for cleanup of all five sites. Since there will not be enough funds to clean up all the sites, letters have been issued by the

Department of Environmental Quality to the effect that no further action will be required for the other four sites. Cleanup at Joliet is scheduled for fall of 1998.

4. Montana Department of Natural Resources and Conservation (DNRC)/Arsenic in the Upper Missouri River Basin

This project is under contract and scheduled to be completed in December 1998. DNRC, in conjunction with the U.S. Geological Survey and Montana State University, is evaluating surface water and groundwater arsenic concentrations and loads in the upper Missouri River system. Data currently being gathered will be used to evaluate the effect of water management actions in the basin and help identify appropriate measures to minimize the impact of arsenic on basin water quality.

1999

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